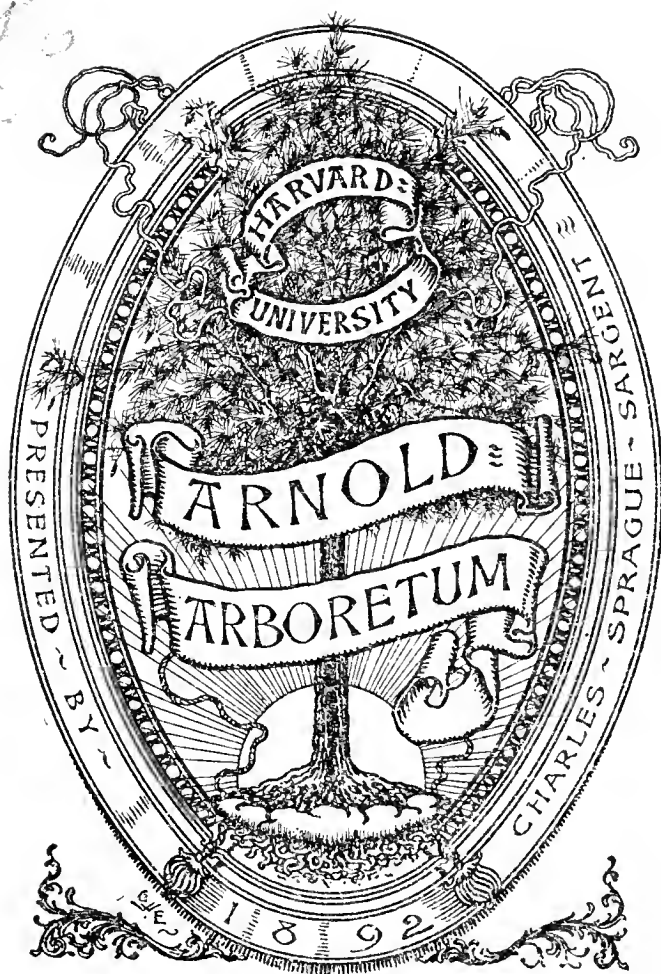


Flora of Switzerland



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THE
FLORA OF SWITZERLAND

BY
A. GREMLI.



TRANSLATED INTO ENGLISH

BY
LEONARD W. PAITSON

FROM THE FIFTH EDITION OF THE
EXCURSIONSFLORA FÜR DIE SCHWEIZ.



Doleschal's Buchhandlung, Luzern, Kapellpl

RECEIVED
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ОБЪЕМ
МУЗЕОГРА
НАВАРА
УПРАВЛЕНИЕ

PREFACE.*)

THE present work is intended, in the first place, for the use of those who are commencing the study of botany, and aims at assisting them in the determination of plants which are new to them. This object can only be attained by using the, so called, analytical method which has accordingly been adopted.

Hoping, at the same time, to be of service to more advanced botanists, I have enumerated the most important new species as well as the critical forms; endeavouring to select from the voluminous materials whatever is best authenticated and most constant, omitting, as far as possible, all doubtful forms.

For special studies I would recommend to the notice of the student: *Bernoulli*, Gefässcryptogamen der Schweiz (1857); *Christ*, Rosen der Schweiz (1873); *Christener*, Hieracien der Schweiz (1863); *Fischer*, Flora von Bern (1878, 4th ed.); *Gaudin*, Flora helvetica (1828—33), the principal work on the Swiss flora; of this there is a summary: *Synopsis floræ helveticæ*, ed. Monnard (1836); *Godet*, Flore du Jura (1853, with supplement 1869); *Rapin*, Guide du botaniste (2nd ed. 1862); *Reuter*, Catalogue des pl. vasc. de Genève (2nd ed. 1861). In *Gremli*, Beiträge zur Flora der Schweiz (1870) directions are found for the study of the genus *Rubus*, as also numerous localities for the rare species. Of works dealing with adjacent countries I may mention before all, *Koch's Synopsis*, an unparalleled work on the German and Swiss floras; also *Ascherson*, Flora der Provinz Brandenburg

*) Author's preface to the fifth German edition.

(1864); *Celakovsky*, Flora von Böhmen (1867—75); *Mars-son*, Flora von Neuvoorpommern (1869); lastly the excellent Flore de France by *Grenier and Godron* (1848—55).

For the study of geographical botany, the magnificent work of *Christ* may be mentioned, Das Pflanzenleben der Schweiz (1879), of which there is now a French edition, revised and enlarged (1883), entitled “La Flore de la Suisse et ses origines”. To doctors and chemists, *Karsten*, Pharmazeutisch-medizinische Botanik (with numerous illustrations) may be recommended.

The book contains all the phanerogams and vascular cryptogams which grow spontaneously in Switzerland. I have enumerated separately, in an appendix (on Plants of neighbouring countries), the species which are found in some adjacent countries, such as northern Savoy, the lake of Como, Veltlin, etc., parts which Gaudin and other Swiss florists have included in their domain. In the appendix will also be found a list of such plants as are doubtful or as have been erroneously indicated as growing in Switzerland, by observers of past and present times. Finally, the Adventitious flora enumerates the foreign plants, chiefly from southern and eastern Europe, which have been observed from time to time in this country. An asterisk (*) has been affixed to the few plants which grow near the borders of Switzerland, or the home of which is not entirely certain, but which have been cited as belonging to the Swiss flora. The same sign serves to mark some hybrid forms which are fairly common, or of which the hybrid nature is not completely beyond doubt; most of the hybrids however are simply given in observations at the end of the genera. I think that, generally speaking, it need not be very difficult to recognise them, if the parents are well known, and it be borne in mind that their characters have an almost equal relation to each of the parents, sometimes, of course, being nearer to one, sometimes to the other; also that these forms are only found scattered or isolated near the parents, their pollen grains being more or less misshapen and not usually producing well developed fruit.

This fifth edition has been carefully revised and improved in numerous details. The genera *Hieracium* *), *Centaurea*, *Carduus*, *Salix* and *Euphrasia*, in particular, have undergone a complete revision. The pronunciation of Latin names is shown by means of an accent placed on the tonic syllable. In other respects the arrangement and nomenclature of the species have been preserved as nearly as possible as in former editions, since the book extending already to 6000 copies in the first four editions, has served as a basis to several catalogues. To the present edition has been added a tabular view of the natural families. In the first part of my "*Neue Beiträge*" (1880) will be found a method by which ligneous plants may be determined by their leaves.

It remains for me to express my hearty thanks to all those who have assisted me, either by sending plants, or in other ways. The following gentlemen may be mentioned in particular: *Alioth* († 1878), *Arvet-Touvet*, *Barbey*, *Boissier* († 1885), *Boll* († 1880), *Boltshauser*, *Brunner*, *Burnat*, *Buser*, *Chevenard*, *Coaz*, *Cornaz*, *Christ*, *Christener* († 1872), *Davall*, *Dutoit*, *Eggler*, *Favrat*, *Father and Son*, *Fischer*, *Focke*, *Godet* († 1879), *Jaccard*, *Jacob*, *Jäggi*, *Lagger* († 1870), *Lerch*, *Leresche* († 1885), *Lüscher*, *Mari*, *Maurer*, *Meli*, *Morel*, *Münch*, *Muret* († 1877), *Papon*, *Rapin* († 1882), *Rhiner*, *Sandoz*, *Schlatter*, *Schmidely*, *Schneider* († 1882), *Schnetzler*, *Siegfried*, *Sulger-Büel*, *von Tavel*, *Townsend*, *Vetter*, *Wolf* and *Zollikofer*.

*) Compare also: **Burnat and Gremli**, les *Hieracium* des Alpes maritimes; and **Gremli**, les *Epervières* du Valais in B. S. M. 1884.

Jongny (Vevey), 1885.

GREMLI.

TRANSLATOR'S PREFACE.

It is hoped that the following translation of the "Excursionsflora" will supply a need, which has long been felt by English visitors to Switzerland, for a complete and portable handbook of the Swiss flora.

No German work so well deserves to be called complete and portable as this excellent little book of Herr Gremli's, the usefulness of which has been well proved by the large number of copies sold.

Through the kindness of the Author the present translation contains not only the new matter included in the French translation by M. J. J. Vetter (1885), but also still later corrections and additions published in the fourth supplement (Neue Beiträge, Heft IV. 1887).

Those only, who have tried it, can understand the difficulty of translating a technical German work into English, and the present translator asks the indulgence of his readers for any imperfections which may be found in his work, which he hopes to remove entirely should a further issue be called for.

Davos, July 1888.

LEONARD W. PAITSON.

I. Introduction.

The use of the Tables.

In order to find out the name of a plant,—to *determine* the plant—it is necessary to seek first the *class*, then the *genus* and lastly the *species*.

It is evident that all pains are lost, if the class is not found or has been mistaken. To commence then—supposing that we have before us a phanerogamous plant—we do not begin by counting the stamens, as is often done, but we first of all see if the flowers are *hermaphrodite* or *unisexual*, *i. e.* if both stamens and styles are found in the same flower, or only styles. Taking the first case, for example, we next see whether the stamens are *united among themselves*, or *to the style*, or if they are *free*, &c.

If the plant in question is found to belong to the 5th class, it is necessary to turn to the *tables for determining the genus*, page 1, commencing with the number 1 on the left hand side of the page, we see whether it has 1, 2, 3 or several styles (or stigmas). If, for example, it has one style, the figure 2 on the right hand side leads to the 2 on the left, where we must see whether the floral envelope is composed of a calyx and a corolla, or if it is simple. Thus, through a series of alternatives, we arrive by degrees at the name of the genus.

The figure following the name of the genus leads, in the next place, to the *tables for determining the species*.

It is advisable to read *both of the alternatives* before comparing; for often—especially in the case of beginners—the precise signification of one alternative is not distinct without the other. In many cases the fruit is indispensable for the determination; consequently it is always necessary in gathering a plant in flower, to see if there is not another specimen *in which the fruit is already developed*. This rule applies especially to the *cruciferae* and *umbelliferae*. In the same way the *subterranean* parts such as the root, root-stock, bulb, or tubercle, are often of primary importance.

The name of each species is accompanied by a remark on its frequency and distribution in Switzerland; this will be found to be of great service to beginners. The species marked with *distrib.* (distributed) are found throughout the whole country,

in all or almost all the twelve districts. It is evident that all the species marked with *Alp.* or *Alp. and Subalp.* are out of the question as regards Canton Schaffhausen as the highest mountains in this Canton do not reach the Subalpine region.

Scale of measurement.



Abbreviations.

— adelph. = — adelphous.	hypog. = hypogynous.
altern. = alternate.	(in-)dehisc. = (in-)dehiscent.
ann. = annual.	(ir-)reg. = (ir-)regular.
cal. = calyx.	l.(s) = leaf (leaves).
calc. = calcareous.	opp. = opposite.
caps. = capsule.	perenn. = perennial.
carp.(s) = carpel(s).	perig. = perigynous.
caul. = cauline.	persist. = persistent.
cor. = corolla.	pet.(s) = petal(s).
decid. = deciduous.	pl.(s) = plant(s).
distrib. = distributed.	rad. = radical.
(ex-)stip. = (ex-)stipulate.	sta.(s) = stamen(s).
fls.(s) = flower(s).	stig.(s) = stigma(s).
fr. = fruit.	var. = variety.
gen. = generally.	

References.

- Beitr. — Gremli, Beiträge zur Flora der Schweiz.
 N. Beitr. — Gremli, Neue Beiträge zur Flora der Schweiz,
 part I (1880), part II (1882), part III (1883).
 B. S. M. — Bulletin des travaux de la Société Murithienne.
 R. B. Z. — Regensburger botanische Zeitung or Flora.
 O. B. Z. — Oesterreichische botanische Zeitschrift.

In order to indicate the distribution of the species in Switzerland, the country has been divided into 12 districts, viz.:

- G. — Canton Graubünden.
 T. — Tessin (Tess.)
 W. — Wallis (Wall.)
 V. — Vaud and Geneva.
 J. — Neuchâtel, Bern (Jura and Seeland), Solothurn and Bâle.
 B. — Freiburg and Bern (central part).
 O. — Bernese Oberland.
 U. — Uri, Schwyz and Unterwalden.

- L. — Lucerne and Zug.
 A. — Appenzell, St. Gall and Glarus.
 Z. — Zürich, Aargau and Thurgau.
 S. — Schaffhausen.
-

Mount. — Mountain region, from 540—1100 meters.

Subalp. — Subalpine region, from 1100—1500 *m* (limit of the beech).

Alp. — Alpine region, from 1500—2400 *m*.

High Alp. — High alpine or snow region, from 1860—2400 *m*.

The indications: *Subalp.*, *Alp.* and *High Alp.* only refer to the *chain of the Alps*; unless the Jura is specially mentioned, the species in question is wanting in this range. On the other hand *Mount.* and *Mount. and Subalp.* are used in a general sense.

† before the name of a species signifies that it is only found in a cultivated state in Switzerland.

* before the name of a species signifies that it is not found within the Swiss borders, or that it is doubtful for this country or is hybrid.

The numbers following the indications of locality show the months of the year, from 1 (January) to 12 (December), when the plants commence to flower; in Cryptogams the time at which the fruit is ripe. For example: 5 = May, 6 = June &c.

The classes of the Linnean System.

- | | | |
|---|-----------------------------|---|
| 1. Plants with distinct flowers | | 2 |
| — Plants without distinct flowers | <i>Cl. 24.</i> | |
| 2. Flowers hermaphrodite | | 3 |
| — Some, at least, of the flowers unisexual | <i>Cl. 21—23.</i> | |
| 3. Stamens neither united among themselves nor with the style | | 4 |
| — Stamens united among themselves or with the style | <i>Cl. 16—20.</i> | |
| 4. Two longer and two shorter, or four longer and two shorter stamens | <i>Cl. 14—15.</i> | |
| — Stamens without these differences in length | <i>Cl. 1—13.</i> | |
-

- Cl. 1. *Monandria*. 1 free sta in a hermaphrodite flower.
 Cl. 2. *Diandria*. 2 free stas in a hermaphrodite flower.
 Cl. 3. *Triandria*. 3 free stas in a hermaphrodite flower.

- Cl. 4. *Tetrandria*. 4 free stas of equal length, in a hermaphrodite flower.
- Cl. 5. *Pentandria*. 5 free stas in a hermaphrodite flower.
- Cl. 6. *Hexandria*. 6 free stas of equal length (or 3 longer and 3 shorter) in a hermaphrodite flower.
- Cl. 7. *Heptandria*. 7 free stas in a hermaphrodite flower.
- Cl. 8. *Octandria*. 8 free stas in a hermaphrodite flower.
- Cl. 9. *Enneandria*. 9 free stas in a hermaphrodite flower.
- Cl. 10. *Decandria*. 10 free stas in a hermaphrodite flower.
- Cl. 11. *Dodecandria*. 12—18 free stas in a hermaphrodite fl.
- Cl. 12. *Icosandria*. 20 or more free stas inserted on the calyx in a hermaphrodite flower.
- Cl. 13. *Polyandria*. 20 or more free stas inserted on the receptacle in a hermaphrodite flower.
- Cl. 14. *Didynamia*. 4 free stas, 2 longer and 2 shorter, in a hermaphrodite flower.
- Cl. 15. *Tetradynamia*. 6 free stas, 4 longer and 2 shorter, in a hermaphrodite flower.
- Cl. 16. *Monadelphica*. All the stas of a hermaphrodite flower united at the base.
- Cl. 17. *Diadelphia*. The stas of a hermaphrodite flower united at the base in 2 bundles, or 1 free, the rest united.
- Cl. 18. *Polyadelphia*. The stas of a hermaphrodite flower united at the base in more than 2 bundles.
- Cl. 19. *Syngenesia*. Anthers of (5) stas united in a tube round the style.
- Cl. 20. *Gynandria*. Stas united with the style in a column.
- Cl. 21. *Monoecia*. Flowers all unisexual; male and female on the same plant.
- Cl. 22. *Dioecia*. Flowers all unisexual; male and female on different plants.
- Cl. 23. *Polygamia*. Flowers partly hermaphrodite, partly unisexual.
- Cl. 24. *Cryptogamia*. Plants without distinct flowers.

Summary of the principal divisions of the Natural System.

I. Phanerogams.

A. Angiosperms.

a) *Dicotyledons*.

1. Polypetalæ.

* Hypogynous polypetalæ.

Fam. 1—24 incl. (*Ranunculaceæ*—*Rutaceæ*).

* Perigynous polypetalæ.

Fam. 25—53 (*Celastraceæ*—*Loranthaceæ*).

2. Monopetalæ.

* Perigynous monopetalæ.

Fam. 54—61 (Caprifoliaceæ—Vacciniaceæ).

* Hypogynous monopetalæ.

Fam. 62—84 (Ericaceæ—Plantagineæ.)

3. Apetalæ.

Fam. 85—102 Amarantaceæ—Salicaceæ).

b) *Monocotyledons*.

Fam. 103—121 (Hydrocharideæ—Gramineæ).

B. Gymnosperms:

Fam. 122 (Coniferæ).

II. Cryptogams.

A. Cormophytæ.

a) *Vascular cryptogams*.

* Hydropterides or Rhizocarpeæ.

Fam. 123 (Marsiliaceæ).

* Bryopterides.

Fam. 124—126 (heterosporous: Isoetæ, Selaginellæ; isosporous: Lycopodiaceæ).

* Ganopterides.

Fam. 127 (Equisetaceæ).

* Filices.

Fam. 128—130 (Ophioglossææ—Polypodiaceæ).

b) *Leafy cellular plants*.

* Musci.

* Hepaticæ.

B. Thallophytes.

* Algæ.

* Lichens.

* Fungi (incl. Schizomycetæ).

OBS.—The hypog. polypetalæ correspond to the *Thalamifloræ*, the hypog. monopetalæ to the *Corollifloræ*, the perig. polypetalæ together with the perig. monopetalæ to the *Calcifloræ*, lastly the apetalæ to the *Monochlamydeæ* of the De Candolle system. —The cellular pls. and the Thallophytes are not treated of in this work.

Tabular view of the Natural Families.*)

Hypogynous polypetalæ.

Insertion of cor. and stas. hypog.—Ovary superior.

§ **Stas numerous, more than 10** (comp. Ranunculaceæ and Resedaceæ).

* *Stas united at the base among themselves. Fls reg. Cor. with 5 pets.*

16. **Malvaceæ.** Stas monadelph. Styles numerous. Fr. composed of numerous 1-seeded carpels arranged in a circle and separating at maturity. Ls often palmati-lobed or—fid, stipulate. Pets. partly united at the base. Cl. 16.

18. **Hypericaceæ.** Stas 3—5-adelph. Styles 3—5. Fr. a caps. or berry. Ls undiv., entire, exstip., often marked with transparent dots. Cl. 18.

* *Stas entirely free.*

Fls reg.

4. **Papaveraceæ.** Seps 2, decid. Pets 4. Style 1. Capsule. Pls with milky juice. Cl. 13.

7. **Cistaceæ.** Seps 5, the 2 outer ones gen. smaller. Pets 5. Style 1. Capsule. Ls undiv. and entire. Gen. shrubs or half-shrubs. Cl. 13.

1. **Ranunculaceæ.** Seps 3—6 or more. Pets 3-many (gen. 5), often small and nectary-shaped and then the cal. is coloured like a cor., less often 0 (Clematis, Thalictrum, Anemone, Caltha). Styles several or numerous, rarely few or 1. Carps. gen. several or numerous, either 1-seeded and indehiscent (nutlets) or many-seeded and dehiscing inwards (follicles), rarely (Actea) berry-like. Cl. 13. Irreg. fls are found in Delphinium and Aconitum; Myosurus gen. has 5 stas.

17. **Tiliaceæ.** Seps 5. Pets 5. Style 1. Fr., by suppression, 1-celled and nut-like, indehiscent. — Ligneous pls.

3. **Nymphæaceæ.** Seps 4—5. Pets numerous, spirally arranged and transformed insensibly into stas. Fr. berry-like, many-celled and -seeded. Water pls with floating ls.

Fls. irreg. (Comp. above, Ranunculaceæ).

9. **Resedaceæ.** Pets 4—7, unequal, gen. 3-many-fid. Ovary open at the top.—Fr. capsular.—Fls in racemes or spikes.

*) We cannot of course strictly follow the natural order of the families here; thus the Pyrolaceæ and Ericineæ, closely allied families, are found in different sections (Polypetalæ and Monopetalæ); in the same way the Sanguisorbeæ, which are apetalous, are far separated from the polypetalous Rosaceæ. — Further, we have taken into consideration principally, or indeed exclusively, those genera which are found in our province, especially as regards such families as are, here, only represented by a single genus.

§ Stas 1—10 (comp. *Acerineæ*).

□ Stas free (comp. *Balsamineæ*).

† Cor. reg. (in *Dictamnus* and some *Cruciferæ* rather irreg.).

0 Ls opp. or whorled.

12. **Silenaceæ**. Cal. gamosepalous. Pets 5, more or less distinctly unguiculate. Stas twice as many as pets, rarely only 5. Styles 2—5. Ovary 1- (or at the base 3—5-)celled. Caps. (in *Cucubalus* berry-like).—Pets and stas often inserted on a more or less elongated carpophore. Herbs with opp., simple, exstip. ls. Inflorescence dichotomous. Chiefly Cl. 10.

13. **Alsinaceæ**. Similar, but cal. polysep. and pets not unguiculate (gen. white). Ovary 1-celled.—Stas sometimes perig. Some (*Spergula*, *Spergularia*) with membranous stipules (comp. *Paronychiaceæ*), rarely apetalous.

14. **Elatinaceæ**. Seps 2—4. Pets 2—4. Stas as many or twice as many as pets. Styles 2—5. Ovary 3—5-celled. Capsule.—Marsh or water pls with simple, stip. ls.

19. **Acerineæ**. Seps and pets gen. 4—5. Stas gen. 8 (5—12), inserted on a fleshy swelling (hypog. disk.). Ovary 2-celled. Fr. in 2, gen. 1-seeded, samaræ. Ligneous pls with palmati-lobed or pinnate, exstip. ls.

0 Ls altern., rad. or scale-like.

a) Stas 8—10, twice as many as pets.—Capsule.

24. **Rutaceæ**. Placentæ axile. Ovaries free, or more or less united.—Ls pinnate or multipinnate, with glandular spots.

63. **Pyrolaceæ**. Placentæ parietal. Ovary 4—5-celled.—Ls undiv., leathery, green. Cotyledons 0.

64. **Monotropaceæ**. Similar but ls scale-like (comp. *Ericaceæ*).

b) Stas 4 or 6 (in some *Cruciferæ* only 2).

2. **Berberideæ**. Seps and pets 4—6. Stas opp. the pets. Berry or caps. Anthers opening by valves.

6. **Cruciferæ**. Seps and pets 4. Stas 6, tetradynamous, i.e. 4 longer and 2 shorter. Siliqua (or silicule), more rarely nutlet, (1-celled, indehisc.), or an articulate siliqua (separating into 1-seeded joints). Cl. 15.

c. Stas 5 or 3.

10. **Droseraceæ**. Stas 5. altern. with the 5 pets. Styles or stigs 3—5. Capsule.—Marsh pls with entire ls.

20. **Ampelideæ**. Stas. 5, opp. the 5 pets. Style 1. Berry.—Twining shrubs with lobed or palmate ls.

94. **Empetraceæ**. Stas 3. Seps and pets. 3 (or, more correctly, divisions of the perianth in 2 series, the inner like a cor.) Drupe berry-like.—Small evergreen shrubs with needle-like ls.

† Cor. irreg.—Style 1.

8. **Violaceæ.** Pets 5, the lower one prolonged in a spur. Stas 5. Caps. 1-celled, 3-valved.—Ls stipulate.

22. **Balsamineæ.** Cor. and stas as above. Caps. 5-celled, opening elastically by 5 valves.—Anthers united, covering the ovary like a veil. Ls. exstipulate.

☐ *Stas more or less united.*

0 Cor. reg. (in *Erodium* the pets. rather unequal).

Stas monadelph. at the base. Cl. 16.

40. **Tamariscineæ.** Stas 10. Style 1. Caps. Seed with a hairy crest.—Lig. pls.

21. **Geraniaceæ.** Stas 10. Styles 5. Schizocarp.: 5 1-seeded carpels detaching themselves from the central beak-shaped axis.

15. **Lineæ.** Stas 5—4, often accompanied by rudimentary filaments. Styles 5—4. Caps. 5—4-celled. The cells div. into 2, 1-seeded secondary cells by a false partition, whence the fr. appears to be 10—8-celled.

23. **Oxalideæ.** Stas 10. Styles 5. Caps. 5-celled, the cells undivided.—Ls ternate, like clover.

0 Cor. irreg. Stas united in 2 bundles (Cl. 17).—Style 1. Stipules 0.

5. **Fumariaceæ.** Cor. spurred. Sep s 2, decid., often very small. Stas 6. Achene 1-seeded, indehisc. (*Fumaria*) or siliqua 2-valved (*Corydalis*).—Ls ternate, biternate or pinnatisect.

11. **Polygalaceæ.** Cor. without spur. Sep s 5, the 2 lateral ones (wings) larger, coloured. Stas 8. Caps. 2-celled.—Ls undiv. and entire.

Perigynous polypetalæ.*)

Insertion of cor. (and stas) peri- or epigynous.—Ovary sup. or inf.

† Ovary free (Comp. Saxifragaceæ and *Rosa* Cl. 12, 23).

§ Ovaries 2 or more. *Fl. reg.* Stas gen. numerous (comp. *Sibbaldia* and *Crassula*).

46. **Crassulaceæ.** Pets 3—20. An equal number of many-seeded follicles with hypog. scales at the base. Stas as many or gen. twice as many as pets.—Fleshy-succulent pls with undiv. exstip. ls.

30. **Spiræaceæ.** Pets gen. 5.—Fr. composed of 2 to 10 2—6-seeded follicles.

31. **Rosaceæ.** Pets gen. 5. Achenes numerous, 1-seeded (rarely in *Agrimonia* 2—1-seeded). Ls often compound, stipulate. The *Amygdalaceæ* are distinguishable by the drupe, the *Pomaceæ* by the ovary and cal.-tube being joined, the *Sanguisorbeæ* by the absence of pets.

*) Of the perigynous monopetalæ **Oxycoccus**, **Phyteuma** and **Jasione** are almost polypetalous.

§ *Ovary 1.** *Cor. irreg.*

28. **Papilionaceæ.** *Cor. papilionaceous.* Stas 10, 9 united, and one free (diadelphous), (Cl. 17), or all the 10 united (monadelphous), Cl. 16. Fr. a pod or articulate pod, rarely a 1-seeded nutlet. Ls often palmate or pinnate.

* *Cor. reg.*

Ligneous pls.

29. **Amygdaleæ.** Stas numerous (20—30). Drupe with a 1-seeded stone.

26. **Rhamnaceæ.** Stas 4—5, inserted on the cal., opp. the pets. Drupe with 2—4 1-seeded stones.

25. **Celastraceæ.** Stas 4—5, inserted on a ring-shaped disk, altern. with the pets. Fr. capsular, 3—5-celled, cells 3—1-seeded.

27. **Terebinthaceæ.** Stas 5. Fr. indehisc., 1-seeded, dry or more or less drupe-like.

Herbaceous plants.

39. **Lythraceæ.** Cal. with 6—12 unequally 2-seriate teeth Stas 6—12, rarely fewer. Capsule gen. 2-celled, with many-seeded cells.

44. **Paronychiaceæ.** Cal. 4—5-partite. Stas 5, rarely 4. Fr. gen. 1-celled, 1-seeded, indehisc., less often a several-celled caps. with 3—4 valves (and then nearly allied to the stipulate *Alsinaceæ*). Ls with scarious stipules. Pets often very small, setaceous. The allied *Scleranthaceæ* are apetalous and exstipulate.

43. **Portulacaceæ.** Cal. with 2 divisions, free or united. Stas 3—12, rarely more. Caps. 1-celled, sometimes many-seeded, circumsciss, sometimes (*Montia*) 3-seeded, 3-valved.—Ls rather fleshy.

† *Ovary inferior.*□ *Fr. dry.—Stipules 0.*

0 Number of stas a multiple of that of the petals.

41. **Philadelphææ.** Caps. many-seeded.—Ligneous pls with opp. ls.

0 Stas as many or twice as many as pets.

49. **Saxifragaceæ.** Pets 5—4. Stas 10—8. Styles 2. Caps. consisting of 2 carps. only free at the top (forming the beaks of the fr.)—Carps. sometimes almost free. *Chrysosplenium* is apetalous.

44. **Onagraceæ.** Pets 4 or 2, in *Isnardia* 0. Stas 8, 4 or 2. Style 1, filiform. Fr. a 4-celled, many-seeded caps., or (*Circæa*) indehisc., 2-celled, 2-seeded, or by suppression 1-celled and 1-seeded, or (*Trapa*) drupe-like, 1-celled, 1-seeded.

35. **Haloragaceæ.** Pets 4. Stas 8, rarely 4. Four sessile stigs. Fr. dividing into 4 1-seeded carps. Fls monœcious.—Water

pls with whorled ls pectinately divided. Allied families are the apetalous *Hippurideæ*, *Callitrichineæ* and *Ceratophyllacæ*.

50. **Umbelliferae**. Pets 5. Stas 5. Styles 2. Fr. a schizocarp, composed of 2 1-seeded carps suspended from a filiform, gen. bifid carpophore. Fls in compound (rarely simple or in form of capitula) umbels. Cl. 5.

□ *Fr. succulent. Gen. ligneous pls.*

* Stas 4—5.

51. **Araliaceæ**. Pets 5. Stas 5. Style 1. Berry.—Ls altern. Fls in umbels.

52. **Cornaceæ**. Pets 4. Stas 4. Style 1. Drupe.—Ls gen. opp.

48. **Grossulariaceæ**. Pets 5, small. Stas 5. Style 2—4-fid. Berry.—Ls altern., palmati-lobed.

53. **Loranthaceæ**. Fls diœcious. Pets 4. Stas 4, opp. to and united with the pets. Stig. sessile. Berry.—Parasites with opp. ls.

* Stas numerous.

32. **Pomaceæ**. Styles 2—5, rarely 1. Ovaries 1—5, united with the cal.-tube which receives a fleshy development in the form of a false berry- or drupe-like fruit crowned by the cal.-limb.

33. **Granateæ**. Style 1. Ovary several-celled. Fr. fleshy-coriaceous, many-celled, the cells arranged in 2 rows one above the other.

47. **Cactaceæ**. Style 1. Ovary 1-celled. Fr. berry-like.—Peculiarly formed pls. Stem much jointed. Ls gen. suppressed to thorns.

Perigynous monopetalæ. *)

Insertion of cor. perigynous or epigynous. Stas gen. inserted on the corolla.
Ovary inferior.

† Fls in a head surrounded by a common many-leaved involucre. Fr. dry, 1-seeded, indehisc.

Stas 5. Style 2-fid.

58. **Compositæ** (Synantheræ). Anthers united in a tube surrounding the style. Cal.-limb consisting of scales, chaff, a pencil of hairs, or 0. Cor. tubular, reg., terminated by 5 teeth; or tongue-shaped on one side; rarely bi-labiate. Fls hermaphrodite or partly 1-sexual, rarely neuter.—Ls gen. altern. Cl. 19.

59. **Ambrosiaceæ**. Anthers free. Fls monœcious, the males in separate capitula, the females enclosed, in pairs, in a hardened gen. prickly envelope.

*) Among perigynous polypetalæ **Trifolium**, **Portulaca** and **Montia** have pets more or less united.

Stas 4. Style entire.

57. **Dipsacæ**. Each fl. in an involucre (exterior calyx) closely enveloping the calyx (and later the fr.).—Ls opp. Fls hermaphrodite.

† Fls not in a head surrounded by a many-leafed involucre.

* Number of stas equal to or less than the divisions of the cor.

0 Ls alternate.

42. **Cucurbitacæ**. Fls 1-sexual. Stas 5, united in pairs, the odd one free, or all free, with strangely twisted anthers. Fr. fleshy with parietal placentæ.—Gen. climbing pls with spiral tendrils. Those of this country are gamopetalous.

60. **Campanulacæ**. Fls hermaphrodite. Stas 5, free or only slightly united. Fr. capsular, 2—3-celled (in some foreign species 5-celled).

0 Ls opp. or whorled.

56. **Valerianacæ**. Stas gen. 3 (1—3). Style 1. Fr. dry, 1-seeded, indehiscent, 3-celled with 2 empty and smaller cells, or, through suppression of the empty cells, 1-celled. Ls opp., exstipulate.

55. **Stellatæ** (**Rubiaceæ**). Stas gen. 4 (3—5). Styles 2, free or united. Fr. a schizocarp. formed of 2 gen. globular, 1-seeded, indehiscent carps.—Ls whorled.

54. **Caprifoliacæ**. Stas gen. 5. Style 1, or 3 sessile stigs. Fr. fleshy, berry- or drupe-like.—Ls opp. Ligneous pls, more rarely herbaceous.

* Stas twice as many as pets, 8—10.

61. **Vacciniacæ**. Anthers prolonged upwards in 2 tubular horns perforated at the top. Berry.—Shrubs. See **Ericacæ**.

Hypogynous monopetalæ.*)

Insertion of the cor. hypogynous. Stas gen. inserted on the corolla.
Ovary superior.

§ Stas, twice as many as the divisions of the corolla, or (in **Ebenacæ**) indefinite.

62. **Ericacæ**. Fls hermaphrodite. Stas gen. 8 or 10, rarely 5, inserted on the receptacle. Anther-cells opening by a terminal pore, often prolonged to a spur. Caps., drupe or berry.—Shrubs. The *Pyrolacæ* and *Monotropacæ* are distinguished by the free pets and the absence of cotyledons, the *Vacciniacæ* by the inf. ovary.

*) Among hypogynous polypetalæ the pets of the following are more or less united: **Delphinium**, **Impatiens**, **Malvacæ**, **Polygalacæ** and **Fumariacæ**.

65. **Ebenaceæ.** Fls (in our species) dioecious. Stas inserted on the cor., in the male fls gen. 16 (8—50). Berry.—Lig. pls.

§ Stas equal in number to, or fewer than the divisions of the corolla.

0 Stas alternate with the cor.-divisions.

* Cor. regular (Comp. Boragineæ and Solanaceæ).

84. **Plantaginaceæ.** Cor. scarious, persist., 4-lobed. Stas 4. Fr. a roundish, dehis. capsule or (Litorella), 1-seeded, indehiscent.

67. **Oleaceæ.** Cor. 4-fid or 4-partite (in Fraxinus excelsior 0). Stas 2. Ovary 2-celled. Caps., samara, berry or drupe. Lig. pls with opp. ls.

68. **Jasminaceæ.** Cor. 5—8-fid. Stas 2. Caps. or berry.—Ls opp. or altern. Lig. pls.

66. **Aquifoliaceæ.** Cor. gen. 4-partite. Stas gen. 4. Ovary gen. 4-celled. Fr. drupaceous.—Lig. pls with altern. (spiny) ls.

69. **Asclepiadeæ.** Cor. 5-fid. Stas 5. Filaments united and provided with appendages which form a secondary corolla. Pollen grains as in Orchidaceæ, united in 2 definitely formed masses. Ovaries 2, separated. Fr.: 2 1-celled follicles of which one is often barren.—Ls gen. opp., entire.

70. **Apocynaceæ.** As above, but stas free and pollen granular.

71. **Gentianaceæ.** Cor. gen. 5-(4—10)fid. Stas gen. 5 (4—10), free. Ovary 1-celled. Fr. capsular, many-seeded, gen. dehiscing by 2 valves.—Ls gen. opposite.

73. **Convolvulaceæ.** Cor. 4—5-fid. Stas 4—5, free. Fr. capsular, gen. 2-celled, cells 1—2-seeded.—Gen. climbing herbs with altern. ls. Cuscuta: a leafless parasite without cotyledons.

72. **Polemoniaceæ.** Cor. 5-fid. Stas 5, free. Ovary 3-celled. Caps. 3-valved.

74. **Boragineæ (Asperifoliæ).** Cor. 5-fid or with 5 teeth. Stas 5, free. Fr. dividing into 4, 1-seeded (rarely 2, 2-seeded), nutlets.—Pl often rough with stiff hairs. Ls altern. Fls gen. in racemes or scorpioid spikes, rolled up before flowering. Echium has a rather irreg. corolla. Cl. 5.

75. **Solanaceæ.** Cor. 5-fid. Stas 5, free. Ovary 2-celled. Fr. capsular or berry-shaped, many-seeded. Embryo gen. curved.—Ls altern. or the upper ones in pairs. Hyoscyamus has a rather irreg. cor. Cl. 5.

* Cor. more or less irreg. (lobes almost equal in some Scrophulariaceæ and Labiatæ).

76. **Scrophulariaceæ (Verbascæ, Antirrhineæ, Rhinanthæ).** Cor. with unequal lobes, or bilabiate, often ringent, deciduous. Stas 4, didynamous *i. e.* 2 shorter and 2 longer or (Scrophularia) a fifth transformed into a staminode; rarely (Verbascum) 5 stas of unequal lengths, or (Veronica) only 2. Ovary gen.

2-celled. Fr. capsular.—One part of the pls of this family, probably all the Rhinanthæ (genera 426—432: cells of anthers prolonged to a point at the base) are parasites on the roots of other pls, they have green ls which easily become black; (radical ls often 0). The genus *Lathræa* which was formerly included in *Orobanchaceæ* is, like these, furnished with scales instead of ls and has a 1-seeded capsule.

77. **Orobanchaceæ.** Cor. bilabiate, persist. Stas 4, didynamous. Ovary and caps. 1-celled. Placentas parietal.—Leafless parasitic pls.

80. **Lentibulariaceæ (Utricularææ).** Cor. bilabiate, spurred. Stas 2. Anthers 1-celled. Fr. capsular, 1-celled, many-seeded. Ovary with free central placentas, many-ovuled as in *Primulaceæ*.—Aquatic or marsh pls.

78. **Labiataæ.** Cor. gen. bilabiate, rarely 1-lipped or with nearly equal divisions. Stas 4, 2 longer and 2 shorter, rarely (*Salvia*) only 2. Style basal. Fr. separating at maturity into 4 1-seeded nutlets.—Ls opp. Fls in 2 opp. clusters (cymes with very short axes) so called verticillasters. Fr. formed as in *Boraginææ* but cor. irreg., stas didynamous and ls opp. Cl. 14.

79. **Verbenaceæ.** Style terminal, otherwise as above.

82. **Globulariaceæ.** Cor. bilabiate. Stas 4. Fr. dry, 1-seeded, indehisc. Fls united in a capitulum surrounded by a common involucre.

0 Stas opp. and equal to cor.-lobes.

83. **Plumbaginææ.** Ovary with a single ovule suspended from the top of a central funicle. Styles 5, united at the base. Fr. an indehisc. utricle.

81. **Primulaceæ.** Ovary with free central placentæ, many-ovuled. Style 1. Fr. capsular. *Samolus* has a half inf. ovary.

Apetalæ. *)

† The absolute male fls never in catkins.

§ Ls several together in whorls.—Fr. 1-seeded, indehiscent. Water pls.

36. **Hippurideæ.** Fls hermaphrodite. Perianth sup., indistinct. Sta. 1.—Ls undivided.

38. **Ceratophyllaceæ.** Fl. monœcious. Perianth inf., multipartite. Stas numerous.—Ls several times dichotomous.

*) This division is more artificial and should be regarded as consisting of the apetalous elements of different families, especially of the division Polypetalæ.—Among hypog. Polypetalæ several **Ranunculaceæ** and some **Alsinaceæ** and **Cruciferæ** are apetalous; among perig. Polypetalæ: **Peplis**, **Isnardia**, **Chrysosplenium**; among hypog. Monopetalæ: **Fraxinus excelsior**; among perig. Monopetalæ: **Xanthium** (fem. fl.).

§ *Ls opp. or alternate.*

* **Ovary inferior.**

91. **Santalaceæ.** Perianth 4—5-fid. Stas 4—5. Fr. 1-celled, 1-seeded, indehisc. Partly root-parasites; nearly allied to *Loranthaceæ* and like these with nude ovules (envelopes wanting).

93. **Aristolochiaceæ.** Perianth 3-fid or tubular, tongue-shaped. Stas 6, united to the style (*Aristolochia*), or 12 free (*Asarum*). Fr. 6-celled, many-seeded, capsular.—*Ls* cordate or reniform at the base.

* **Ovary free.**

0 Fr. separating into several 1-seeded carpels.

95. **Euphorbiaceæ** (incl. *Acalyphaceæ* and *Buxaceæ*). Fls monœcius or diœcious. Perianth 0 or (*Mercurialis*) with 3 divisions. Styles 2—3, often 2-fid. Fr. consisting of 3 carpels which separate, at maturity, from the central persist. axis.

37. **Callitrichineæ.** Fls 1-sexual, gen. furnished with 2 membranous bracts. Perianth 0. Sta. 1. Stigs 2. Fr. dividing at last into 4 cells (carps).—Water pls with opp. *ls* and axillary, scarcely visible fls.

0 Fr. undiv., 1-celled, 1-seeded.

† *Ls* with (sometimes decid.) stipules.

88. **Polygonaceæ.** Stipules extending beyond the base of the petiole and surrounding the stem as a sheath. Perianth 3—6-partite, green or coloured.

96. **Urticaceæ** (incl. *Canabineæ*, *Moreæ*). Stipules free or united among themselves. Perianth 3—6-partite, gen. green. Fls monœcious, diœcious or polygamous.—Pls varying much in form.

31. **Sanguisorbeæ.** Stipules united to the petiole. Perianth (cal.) 4- or 8-partite.—*Ls* imparipinnate or palmati-lobed or -sect. See *Rosaceæ*.

† *Ls* exstipulate.

□ Seed exalbuminous.

90. **Laurineæ.** Stas inserted at the base of the perianth. Anthers each opening upwards by an ascending valve.

89. **Thymeleaceæ.** Stas inserted in the throat or tube of the perianth. Style 1. Achene dry or drupaceous.

□ Seed albuminous.

92. **Elæagnaceæ.** Stas and style as above. Fr. surrounded by the (now) fleshy perianth tube and appearing like a drupe.—*Lig.* pls with scaly *ls*.

45. **Scleranthaceæ.** Stas as above. Styles 2.—*Ls* opp. Distinguished from *Paronychiaceæ* in the want of cor. and stipules Embryo annular as in the 2 following.

86. **Chenopodiaceæ** (*Salsolaceæ*). Stas inserted on the base of perianth or on the receptacle. Perianth herbaceous or fleshy.

Fls gen. ebracteate. Embryo annular or surrounding the albumen spirally.

85. **Amaranthaceæ**. Same characters, but perianth more or less membranous and fls with 2 bracts.

87. **Phytolacaceæ**. Fr. a true, 10-celled, berry.

† Fls unisexual in separate inflorescences, the males at least in catkins (Amentaceæ). Lig. pls.

* Fls monœcious. (Cl. 21.)

98. **Juglandææ**. Ovary 1-celled, 1-ovuled. Drupe 2-valved. —Ls imparipinnate. Rather allied to Terebinthaceæ.

99. **Fagineæ** (Quercineæ). Ovary 3—many-celled, cells 2-ovuled. Styles or stigs 3—several. Male fls with 5—10-fid or -partite perianth. Achene 1-seeded, nut-like, single or several together, surrounded by a cupule.

100. **Carpineæ** (Coryleæ). Ovary 2-celled, cells 1-ovuled. Styles 2, filiform. Male fls without perianth. Achene 1-seeded, surrounded by an involucre.

101. **Betulaceæ**. Ovary and styles as above. Male fls with perianth divisions free or united.

97. **Platanaceæ**. Ovary 1-celled, cell 2-ovuled. Perianth 0. Male and female fls in globular catkins suspended on long peduncles.

Fls diœcious. (Cl. 22.)

102. **Salicaceæ**. Fr. a 2-valved, many-seeded capsule. Seed crowned with a tuft of hairs.

Monocotyledons.

a) Perianth complete, gen. with 6 divisions, superior.

§ Seeds albuminous.

116. **Dioscoreaceæ**. Fls diœcious. Perianth resembling a calyx, slightly coloured. Stas 6. Berry.—Stem winding. Ls net-veined.

114. **Amaryllideæ**. Fls hermaphrodite. Perianth petaloid. Stas 6, capsule.—Bulbous pls with linear ls. Distinguished from *Liliaceæ* by their inf. ovary.

113. **Irideæ**. Same characters, but stas 3.—Pls with noded or bulbous root-stock. Ls linear or ensiform.

§ Seed exalbuminous.

112. **Orchidaceæ**. Fls hermaphrodite. Perianth irreg., the 3 outer and 2 inner perianth divisions fairly similar; the third inner one (the lip) gen. turned downwards by the torsion of the ovary, peculiarly formed and often prolonged to a spur. Stas united with the stig. in a column (gynostegium), the 2 lateral ones gen. barren, the central one fertile (in Cypri-

pedium the 2 lateral ones fertile). Pollen grains cohering together in 2—4 pollen-masses of definite form. Capsule. Pls often having tuberous roots. Cl. 20 (Gynandria).

103. **Hydrocharideæ**. Fls diœcious, enclosed, before the anthesis, in a spathe of 1—2 valves. Perianth divisions 6, the 3 outer ones herbaceous, the 3 inner ones petaloid. Fr. gen. berry-like.—Water pls.

b) Perianth complete, gen. with 6 divisions (comp. Asparagaceæ), inferior.

* Fr. consisting of several free or partly united carps, or a schizocarp.

104. **Alismaceæ**. Divisions of the perianth 6, the 3 outer ones herbaceous, the 3 inner ones petaloid. Stas 6—many. Ovaries 6—many, 1—2-ovuled. Seed exalbuminous.

105. **Butomaceæ**. Perianth as above. Stas 9. Ovaries 6, many-ovuled. Seed exalbuminous.

106. **Juncagineæ**. Perianth divisions similar, herbaceous or slightly coloured. Stas 6. Ovaries 3—6, 1—2-ovuled. Seed exalbuminous.—Ls linear, narrow.

118. **Colchicaceæ** (Melanthaceæ). Perianth divisions petaloid (in *Tofieldia* slightly coloured). Stas 6. Ovaries 6, many-ovuled. Seed albuminous.

* Ovary single, undivided. Capsule or berry.—Seed albuminous.

117. **Liliaceæ**. Perianth petaloid. Stas 6. Capsule.—Pls often having bulbs.

115. **Asparagaceæ** (Smilaceæ). Perianth gen. petaloid. Stas 6, rarely 4 or 8. Berry.—Pls with root-stocks.

119. **Juncaceæ**. Perianth glumaceous. Stas 6 or 3. Capsule.—Resembling Cyperaceæ in habit but with a perianth and a capsular fruit.

c) Perianth 0 or incomplete, formed of hairs or scales (in *Acorus* fairly complete).

1. *Pls preferring marshes or damp places. Fls drawn together on a fleshy axis (spadix), without glumaceous bracts. Root-stock tuberous or creeping. Fr. indehiscent. Seed albuminous.*

111. **Aroideæ**. Fls unisexual or hermaphrodite on a spadix supported by a large bract or surrounded by a spathe. Fr. dry or berry-like.—Ls cordate or sagittate, in *Acorus* linear.

110. **Typhaceæ**. Fls unisexual, male and female in separate cylindrical or globular inflorescences. Fr. dry.—Ls linear, grass-like.

2. *Submerged or floating water pls. Fls solitary or in spikes.*

108. **Naiadaceæ.** Fls monœcious or diœcious, male fls with a perianth. Sta. 1. Ovary 1. Seed exalbuminous.—Submerged pls.

107. **Potamaceæ.** Perianth 0 (in Potamogeton the anther-appendages resemble a perianth), or the female fl. with a campanulate, membranous perianth. Stas 1—4. Ovaries several. Seed exalbuminous.—Water pls having ls.

109. **Lemnaceæ.** Small floating pls without ls, and with flattened articulate stem (frond). Perianth 0. Seed albuminous.

3. *Grasses or glumaceæ with narrow ls. Fls surrounded by glumaceous bracts, solitary or in spikes.—Fr. a 1-seeded achene. Seed rich in albumen.*

120. **Cyperaceæ.** Fl. in the axil of a single glume. Anthers fixed by their bases to the top of the filaments. Style 1, div. into 2—3 stigs.—Stem gen. 3-cornered, nodes 0 or indistinct. Sheaths closed.

121. **Gramineæ.** Each fl. between 2 glumes. Anthers fixed by their centres. Styles gen. 2.—Stem gen. round, with node-like articulations. Sheaths gen. open, their inner membrane prolonged at the base of the ls into a membranous tongue (ligule).

Gymnosperms.

122. **Coniferæ** (Gnetaceæ, Taxineæ, Cupressineæ, Abietineæ). Fl monœcious or diœcious; the males in catkins, the females solitary (Taxus), or in cone-shaped or berry-like catkins. Perianth 0 (except in Ephedra). Lig. pls gen. with acicular ls.

Vascular cryptogams.

1. Spores, some large (1 in each sporocarp), some small (numerous in each sporocarp).—Pls creeping in the mud or (Salviniaceæ, which are not found in this country) floating in the water, of very varying habit. Hydropterides.

123. **Marsiliaceæ.** Sporocarps at the bases of ls, enclosed in a fruit-like envelope.

2. Sporocarps containing several spores, solitary in the leaf-axils. Bryopterides.

124. **Isoëtææ.** Rhizome short, bulbous, with much longer, subulate ls. Sporocarps of two sorts, the one with large spores, the other with smaller, more numerous ones.

125. **Selaginellaceæ.** Habit of the following family but sporocarps as in the last.

126. **Lycopodiaceæ.** Stem more or less elongated, often dichotomous, covered with numerous small, simple ls. Sporocarps all of the same form in the axils of bracts resembling ls, or of bracts having a different form (and being then united in spikes).

3. Sporocarps with several spores, arranged on the inner face of peltate, whorled scales which are disposed in the form of a terminal spike. Spores all of the same form. Stem articulate, simple, or with whorled branches. Ls reduced to toothed sheaths. *Ganopterides*.

127. **Equisetaceæ.** Spores each surrounded by 4 elastic, thread-like appendages, club-shaped at the top and rolled spirally round the spores.

4. Sporocarps containing several spores arranged in groups on the underside of the (sometimes modified) ls. Spores all of the same form. Stem inarticulate, forming a rhizome; but ls (fronds) developed, often much divided, gen. rolled up (like a watch-spring) while young. *Filices*.

125. **Ophioglosseæ.** Fronds not rolled up spirally while young, of two kinds, the one fertile, modified (in the form of a panicle or spike), the other barren. Sporocarps let into the leaf-substance, opening by a longitudinal fissure.

129. **Osmundaceæ.** Fronds rolled up spirally while young. Sporocarps pedicelled, arranged in a panicle in the upper (transformed) part of the frond, without an elastic ring, opening by 2 valves.

130. **Polypodiaceæ.** Fronds rolled up spirally when young. Sporocarps united on the lower side of the frond (modified or not by fructification) in groups (sori) of various forms, which are often covered by an indusium, surrounded by an articulate, elastic ring and bursting irregularly.

II. Table for determining the genus.

Cl. 1. Monandria.

- | | |
|---------------------------------------|-------------------|
| 1. Aquatic pls with indistinct fls | 2 |
| — Land pls | 3 |
| 2. Ls whorled. Style 1 | Hippuris. 190. |
| — Ls opp. Styles 2 | Callitriche. 191. |
| 3. Style 1 | 4 |
| — Styles 2 | 5 |
| 4. Ls opp. Cor. spurred (rose or red) | Centranthus. 278 |
| — Ls altern. Cor. 0 | Alchemilla. 175 |
| 5. Herbaceous pls. See Cl. 5, 133 | Blitum. 488. |
| — Gramineæ. See Cl. 3, 40 | Vulpia. 654. |

Cl. 2. Diandria.

- | | |
|---|-------------------|
| 1. Lig. pls with opp. ls | 2 |
| — Herbaceous pls | 5 |
| — Gramineæ or Glumaceæ | 13 |
| 2. Pets 4 or 0. Ls pinnate | Fraxinus. 380. |
| — Cor. gamopetalous, 4--8-fid | 3 |
| 3. Cor. 5--8-fid. Ls pinnatisect | Jasminum. 381. |
| — Cor. 4-fid. Ls undivided | 4 |
| 4. Fr. a drupe. Ls grayish white underneath | Olea. 377. |
| — Fr. capsular. Ls oval-cordate | Syringa. 379. |
| — Fr. berry-shaped. Ls oblong-lanceolate | Ligustrum. 378. |
| 5(1). Pl. composed of small fronds floating freely on the water | Lemna. 535. |
| — Pls with stems and ls | 6 |
| 6. Seps 4. Cor. 0 | Lepidium. 67. |
| — Cal. and cor. both present | 7 |
| 7. Pets 2; deeply 2-fid | Circæa. 187. |
| — Cor. gamopetalous. | 8 |
| 8. Cor. spurred, bilabiate or personate | 9 |
| — Cor. not spurred | 10 |
| 9. Cal. 5-partite. Fls violet or white, solitary. Ls non divided, in rosettes. Marsh pls | Pinguicula. 466. |
| — Seps 2. Fls yellow, 3--10. Ls capillary-multifid, root-like, with air-bladders. Aquatic pls | Utricularia. 467. |
| 10. Ovary 4-partite. 4 achenes. (Ls opp.) | 11 |
| — Ovary undiv. Caps. 2-celled | 12 |
| 11. Cor. 4-fid (lobes almost equal) | Lycopus. 437. |
| — Cor. bilabiate | Salvia. 438. |
| 12. Cor. rotate (gen. blue), 4-fid, one lobe rather larger, ebracteate | Veronica. 423. |
| — Cor. tubular-infundibuliform (whitish), bilabiate--4-fid, with 2 bracts like the cal.-lobes | Gratiola. 421. |

- ### Cl. 3. **Triandria.**

- | | |
|---|---------------------------|
| 1. Styles 1—2 | 2 |
| — Styles 3. (Ls opp. or whorled. Fl. white.) | 79 |
| 2. Floral envelope composed of cal. and cor. Ls opp. | 3 |
| — Fl. envelope composed of cal. and cor. Ls whorled | Asperula. 275. |
| — Fl. envelope simple or suppressed. Ls altern. whorled or 0 | 5 |
| 3. Cor. inf., 5-partite, white. Capsule. Seps 2. Ls entire. | Montia. 199. |
| — Cor. sup. Fr. an achene | 4 |
| 4. Cal.-limb developing at maturity into a feathery pappus. Perenn. pls | Valeriana. 279. |
| — Cal.-limb toothed at maturity. Ann. pls | Valerianella. 280. |
| 5 (2). Fls with a distinct perianth, not in a spike | 6 |
| — Fls in a spike. Perianth 0 or suppressed | 9 |
| 6. Perianth green (sepaloid), 5-partite. Fls solitary, axillary. Ls acicular. | Polycnemum. 486. |
| — Perianth scarious, 6-partite. Rushes | Juncus. 597. |
| — Perianth petaloid, coloured, with a 6-partite limb | 7 |
| 7. Perianth irreg., almost bilabiate (rose-coloured). Fls in a spike | Gladiolus. 566. |
| — Perianth regular | 8 |
| 8. Lobes of the perianth campanulate-infundibuliform, connivent, with an elongated tube. Stigs clavate. Ls linear, springing, like the fl. from the root | Crocus. 565. |
| — The 3 outer lobes of the perianth bent back. Stigs large, petaloid, covering the stas. Ls ensiform, partly equitant. | Iris. 597. |
| 9 (5). True grasses (Gramineæ). Fls (<i>i. e.</i> stas and styles) between two scales (glumellas). Styles gen. 2. Stem gen. round, articulate, with nodes. Sheaths gen. open | 10 |
| — Sedges (Cyperaceæ). Fls in the axil of single scales (glumellas). Style 1. Stem gen. 3-angular, nodes 0 or indistinct. Sheaths closed | 72 |
| 10. Spikelets sessile or very shortly peduncled, forming a spike <i>i. e.</i> sessile on the rachis (immediate prolongation of the stem) | 11 |
| — Spikelets peduncled, forming a panicle, which, however, is sometimes contracted like a spike (the spikelets always in clusters on separate twigs) | 24 |
| 11. A solitary spike terminating the stem. Stig. uncoloured | 12 |
| — Several spikes (2—11) digitate at the top of the stem. Stig. red | 22 |

12. Spikelets in fascicles (about 10 in number) arranged in an interrupted spike. Only Italian Switzerland. **Oplismenus.** 614.
 — Spikelets 3 (2—5) together **13**
 — Spikelets almost always solitary **15**
 13. Spikelets applied against lateral cavities of the rachis **14**
 — Spikelets not in the cavities of the rachis. Only Tess. **Heteropogon.** 612.
 14. Spikelets with only 1 fl. **Hordeum.** 664.
 — Spikelets with 2 fls*) **Elymus.** 663.
 15 (12). Lower glumella with a dorsal awn **Gaudinia.** 659.
 — Lower glumella awnless or with a terminal awn **16**
 16. Glumes 0. Style (or stig.) 1 **Nardus.** 666.
 — Glumes 1—2. Stigs. 2 **17**
 17. Lateral spikelets with only 1 glume, the narrow side against the rachis **Lolium.** 665.
 — Spikelets with 2 glumes, the broad side to the rachis **18**
 18. Spikelets entirely sessile **19**
 — Spikelets very shortly (but distinctly) pedicelled . **20a**
 19. Glumes linear-acicular; spikelets with 2 fls and a third suppressed (or occasionally developed) . **Secale.** 662.
 — Glumes oval, lanceolate or lanceolate-linear. Spikelets with 3—several fls **20**
 20. Spikelets more or less swollen. Glumes oval or oblong **Triticum.** 661.
 — Spikelets not swollen. Glumes lanceolate or linear-oblong **Agropyrum.** 660.
 20a (18). Spikelets with 1 fl. Dwarf-grass. . **Mibora.** 624^{bis}
 — Spikelets with 3—several fls **21**
 21. Glumes with 3—7 nerves. Ovary hairy at the top. **Brachypodium.** 657.
 — Glumes with 1—3 nerves. Ovary glabrous **Nardurus.** 658.
 22 (11). Spikelets solitary, awnless **Cynodon.** 625.
 — Spikelets in pairs **23**
 23. The sessile spikelet hermaphrodite, awned; the pedicelled spikelet male, awnless. **Andropogon.** 610.
 — Both spikelets hermaphrodite and awnless **Digitaria.** 615.
 24 (10). Panicle contracted (also during the flowering period) into a more or less dense spike **25**
 — Panicle loose, sometimes racemose, but, at any rate during the anthesis, spreading **42**
 25. Spikelets 1-fl **26**
 — Spikelets with 2—several fls **34**

*) In the species belonging to this country the spikelets have often only 1 fl., with a second rudimentary fl.; they may be easily distinguished from all species of *Hordeum* by the spathes being rough with retrorse hairs.

- | | | |
|----------|--|---------------------|
| 26. | Upper glume covered on the back with numerous hooked prickles. Only in Wallis | Tragus. 613. |
| — | Upper glume without these prickles | 27 |
| 27. | Spikelets with numerous awn-like bristles at the base | Setaria. 618. |
| — | Spikelets without these bristles | 28 |
| 28. | Glumes with a long awn springing from an incision in the point | Polypogon. 629. |
| — | Glumes awnless or, in Phleum, with a short awn | 29 |
| 29. | Glumella single, awn inserted on the back | Alopecurus. 623. |
| — | Glumellas 2 | 30 |
| 30. | Stigs springing from the top of the spikelet | 31 |
| — | Stigs springing from the base or side of the spikelet | 33 |
| 31. | Glumes with a winged keel | Phalaris. 620. |
| — | Glumes with a wingless keel | 32 |
| 32. | Spikelets with or without a rudimentary upper second fl. Stas 3. | Phleum. 624. |
| — | Spikelets with a central hermaphrodite fl, 2 empty lateral glumellas, and rudiments of 2 lower fls. Stas 2. | Anthoxanthum. 622. |
| 33 (30). | Glumellas with hair at the base which is, at least, longer than the diameter of the glumella. Glumes compressed-convex | Calamagrostis. 631. |
| — | Glumellas without hairs at the base. Glumes much compressed, the base swollen, almost globular | Gastridium. 632. |
| 34 (25). | A pectinate bract composed of barren glumellas at the side of the spikelet | Cynosurus. 625. |
| — | This bract not present | 35 |
| 35. | Awns 15—30 cm long | Stipa. 627. |
| — | Awns much shorter or 0 | 36 |
| 36. | Stigs springing from the end of the fl., filiform. Spiciform panicle oval or oblong | Sesleria. 639. |
| — | Stigs. springing from the base or side, plumose | 37 |
| 37. | Awns springing from above or below the centre of the back of the glumella | 38 |
| — | Awns 0, or springing from near the top | 39 |
| 38. | Fr. not grooved. Ls flat | Trisetum. 640. |
| — | Fr. grooved. Ls setaceous | Aira. 641. |
| 39. | Spikelets with clavate rudiments (suppressed fls) | Melica. 643. |
| — | Fls all complete | 40 |
| 40. | Sta 1. Lower glume with a long awn | Vulpia. 654. |
| — | Stas 3 | 41 |
| 41. | Lower glume with 3, upper with 7 nerves. Stem leafy up to the panicle. Only in Wall. | Sclerochloa. 646. |
| — | Lower glume with 1, upper with 3 nerves. Stem only leafy at the base or up to the middle | Koeleria. 635. |
| 42 (24). | Spikelets 1-fl'd. | 43 |
| — | Spikelets with 2—many fls | 52 |

43. Glumes 0 **Oryza.** 619.
 — Glumes 2 **44**
44. Branches of the panicle simple, terminated by 3 spikelets
Pollinia. 611.
 — Branches of the panicle (or secondary branches) bearing
 several spikelets **45**
45. Panicle composed of spikes . . . **Echinochloa.** 616.
 — Panicle not composed of spikes . . . **46**
46. Leaf-sheaths with numerous long spreading hairs
Panicum. 617.
 — Leaf-sheaths without long spreading hairs. . . **47**
47. Stigs springing from the top of the spikelet. Glumellas
 awnless **Phalaris.** 620.
 — Stigs springing from the base or side of the spikelet **48**
48. Fls surrounded by long hairs at the base . . . **49**
 — Fls without, or with very short, hairs . . . **50**
49. Awn almost 3 times as long as the glumella
Lasiagrostis. 628.
 — Awn 0 or scarcely longer than the glumella
Calamagrostis. 631.
50. Hairs at the base of the fls about $\frac{1}{3}$ as long as the glu-
 mellas **Calamagrostis.** 631.
 — Hairs 0 or extremely short **51**
51. Glumellas hardened at maturity, cartilaginous **Milium.** 626.
 — Glumellas membranous, not hardened **Agrostis.** 630.
- 52 (42). Stigs springing like a brush from below the summit
 of the fl. **53**
 — Stigs springing from the base, plumose . . . **54**
53. Spikelets with long silky hairs; fl. with 3 stas
Phragmites. 633.
 — Spikelets without silky hairs; the 2 lateral (lower) fls male,
 with 3 stas, the central (upper) fl. hermaphrodite, with
 2 stas. **Hierochloa.** 621.
54. Lower branches of the panicle solitary (altern.), terminated,
 like the secondary branches, by clusters of crowded spike-
 lets **Dactylis.** 651.
 — Branches of the panicle solitary or in pairs, or whorled.
 Spikelets not crowded **55**
55. Some, at any rate, of the fls awned **56**
 — None of the fls awned **64**
56. Spikelets with 2 fls, one of which is male . . . **57**
 — Spikelets with 2—several fls, all hermaphrodite . . . **58**
57. The upper fls male. Awns short . . . **Holcus.** 637.
 — The lower fl. male. Awns long. . . **Arrhenatherum.** 638.
58. Lower glumella with an awn at the middle or base of its
 back **59**
 — Lower glumella with an awn at the top or, when this is
 incised, in the incision **61**

59. Lower glumella truncate-denticulate at the top. Spikelets small **Deschampsia.** 636.
 — Top of the lower glume 2-dentate or 2-fid **60**
60. Fr. pubescent, furrowed on the inner side. Spikelets fairly large (12—30 mm) with 2—several fls **Avena.** 639.
 — Fr. glabr., not furrowed. Spikelets small (5—8 mm), with 2—3 fls. **Trisetum.** 640.
 — Fr. glabr., furrowed on the inner side. Spikelets very small, about 2 mm, with 2 fls **Aira.** 641.
- 61 (58). Lower glumella shortly 3-toothed or 3-fid at the top, with a long awn in the notch. Glumes as long as the spikelet **Danthonia.** 642.
 — Lower glumella not 3-toothed. Glumes shorter than the spikelet **62**
62. Stigs inserted below the top of the ovary **Bromus.** 656.
 — Stig. (rel. style) inserted at the top of the ovary **63**
63. Stig. red **Molinia.** 650.
 — Stig. uncoloured **Festuca.** 655.
- 64 (55). Spikelets with clavate rudiments of suppressed fls **Melica.** 643.
 — Spikelets with the fls all complete **65**
65. Spikelets rounded-cordate, on slender quivering pedicels **Briza.** 644.
 — Spikelets oblong, lanceolate or linear **66**
66. Lower leaf-sheaths covering the nodes, whence the stem appears inarticulate **Molinia.** 650.
 — Lower leaf-sheaths not covering all the nodes **67**
67. Axis of the spikelet, as also the upper glumella, persistent. Spikelets narrow, many-fld, Cyperus-like **Eragrostis.** 645.
 — Fls of the spikelets detaching themselves by joints **68**
68. Ann. pls, the spikelets with short, thick pedicels. Glumes almost equal **Scleropoa.** 653.
 — Perenn. pls **69**
69. Spikelets 2-fld. Pls growing in or near water **Catabrosa.** 649.
 — Spikelets with many fls **70**
70. Fr. adherent to or united with the glumellas (except *F. sylvatica*). Lower glumella pointed or acuminate **Festuca.** 655.
 — Fr. free **71**
71. Lower glumella with a rounded back and obtuse or truncate tip. Pls preferring the water **Glyceria.** 648.
 — Lower glumella keeled, pointed or acuminate **Poa.** 647.
- 72 (9). Glumellas more or less distinctly distichous **73**
 — Glumellas irreg. imbricate **74**
73. Spikelets united in a fascicle or corymb, with 20—30 fertile glumellas **Cyperus.** 599.
 — Spikelets in a head, glumellas 6—9, the lower ones barren **Schænus.** 600.

74. Achenes surrounded by long hairs (hypog. bristles) forming a cottony tuft **Eriophorum.** 606.
 — Achenes without these hypog. hairs, or with them shorter than the glumellas **75**
 75. Lower glumellas shorter than the upper (stem leafy) **76**
 — Lower glumellas not shorter than the upper **77**
 76. Leaf margins coarsely denticulate. Stem 10 *dm* and more **Cladium.** 601.
 — Leaf-margins less coarse, not denticulate. Stem 2—4 *dm* **Rhynchospora.** 602.
 77. Style filiform, inarticulate, deciduous . . . **Scirpus.** 604.
 — Style dilated at the base, persistent **78**
 78. Spikelets solitary, terminal **Heleocharis.** 603.
 — Spikelets several **Fimbristylis** 605.
 79 (1). Cor. gamopetalous, 5-partite, one of the divisions reaching to the base. Seps 2. **Montia.** 199.
 — Pets 3 **80**
 — Pets 5. Ls opp. or in whorls of 4 **81**
 80. Ls whorled **Elodea.** 526.
 — Ls opposite **Elatine.** 112.
 81. Caps 3-valved. Ls with scarious stipules **Polycarpon.** 204.
 — Caps opening by 6 teeth. Ls exstipulate **82**
 82. Pets denticulate at the top **Holosteum.** 108.
 — Pets 2-partite **Stellaria.** 109.

Cl. 4. Tetrandria.

1. Ls in whorls of 4—12 (*Stellatæ*) **2**
 — Ls never all whorled, sometimes 0 at the time of flowering **5**
 2. Cor. stellate, rotate or flat campanulate **3**
 — Cor. infundibuliform or infundibuliform-campanulate (the tube distinct, often long) **4**
 3. Fr. succulent. Stig clavate **Rubia.** 276.
 — Fr. dry. Stig capitate **Galium.** 277.
 4. Cal.-limb distinct, with 6 teeth, persist. on the fr. **Sherardia.** 274.
 — Cal.-limb with 4 teeth, or indistinct, disappearing on the fr. **Asperula.** 275.
 5 (1). Ligneous pls **6**
 — Herbs or suffrutescent pls **9**
 6. Styles 2. Cor. 0 **Ulmus.** 508.
 — Styles 4. Cor. deeply 4-partite, white **Ilex.** 376.
 — Style 1 **7**
 7. Pets superior, white or yellow **Cornus.** 267.
 — Pets inf., greenish **8**
 8. Stas opp. the pets. Drupe **Rhamnus.** 130.
 — Stas altern. with the pets. Fr. capsular **Evonymus.** 129.

9. Leafless parasites with a filiform stem and small clustered fls
Cuscuta. 392.
 — Leafy pls **10**
10. Floral envelope composed of cal. and cor. **11**
 — Fl. envelope simple (cal. or perianth) **24**
11. Style 1 **12**
 — Styles 2—4 (Caps. Ls opp.) **21**
12. Pets 4 **13**
 — Cor. gamopetalous **15**
13. Cor. sup. Water pls. Fr. a nut **Trapa.** 188.
 — Cor. inf. Land pls **14**
14. Pets red, with para-cor. of 4 yellow, hood-shaped pets
Epimedium. 22.
 — Pets white. Para-cor. 0 **Cardamine.** 36.
- 15 (12). Fls in a head surrounded by a calyx-like involucre.
 Ls opp. (*Dipsacæ*) **16**
 — Fls solitary, in whorls, heads, or spikes (comp. also some
Labiatae—*Mentha*, *Chaiturus* and *Verbena*, Cl. 14) **19**
16. Stem prickly **Dipsacus.** 281.
 — Stem without prickles **17**
17. Recept. with hairs instead af paleæ **Knautia.** 283.
 — Recept. with paleæ **18**
18. Outer cal. with 8 teeth **Cephalaria.** 282.
 — Outer cal. with a herbaceous, 4-fid, limb **Succisa.** 284.
 — Outer cal. with a scarious, transparent, campanulate or
 rotate limb **Scabiosa.** 285.
- 19 (15). Fls solitary in the l.-axils. Cor. shorter than cal.
Centunculus. 471.
 — Fls in heads or spikes **20**
20. Cor. (scarious) reg. with 4-partite limb and prominent stas
Plantago. 482.
 — Cor. (blue) irreg. bilabiate **Globularia.** 480.
- 21 (11). Cor. gamopet., 4-fid, blue **Gentiana.** 388.
 — Pets 4, white **22**
22. Divisions of the cal. 2—3-fid **Radiola.** 114.
 — Divisions of the cal. entire **23**
23. Styles 4. Caps. 8-toothed **Cerastium.** 110.
 — Styles 4. Caps. 4-valved **Sagina.** 103.
 — Styles 2. Caps. 2-valved **Buffonia.** 104.
- 24 (10). Style 0 (stigs 4). Water pls with fls in spikes and
 undiv. ls **Potamogeton.** 532.
 — Style 1. Land or bog pls **25**
25. Cor. or perianth sup. Ls entire **26**
 — Cor. or perianth inf. Ls altern. **27**
26. Ls opp., broad **Isnardia.** 186.
 — Ls altern., narrow **Thesium.** 497.
27. Ls pinnate. Fls in dense terminal heads **Sanguisorba.** 176.
 — Ls undiv., lobed or palmatipartite **28**

28. Cal. 8-fid. Ls lobed or palmatipartite **Alchemilla.** 175.
 — Cal. 4-fid or -partite. Ls undiv. **29**
 29. Fl. hermaphrodite in a terminal raceme. Perianth petaloid,
 white **Smilacina.** 576
 — Fls polygam., in axillary clusters. Perianth herbaceous,
 green **Parietaria.** 506.

Cl. 5. Pentandria.

1. Style 1 **2**
 — Styles 2 **61**
 — Styles (or stigs) 3—several **134**
 2. Floral envelope composed of cal. and cor. **3**
 — Floral envelope simple (perianth or cal.) **57**
 3. Cor. polypetalous **4**
 — Cor. gamopet. (monopet.) **13**
 4. Cor. sup. Ligneous pls **5**
 — Cor. inferior **6**
 5. Ls coriaceous, evergreen. *Ivy* **Hedera.** 266.
 — Ls herbaceous, falling in autumn. *Currant* **Ribes.** 209.
 6. Cor. reg., not spurred. Ligneous pls **7**
 — Cor. irreg., spurred. Herbs **12**
 7. Ls palmatilobed. *Vine* **Vitis.** 141.
 — Ls undiv. **8**
 8. Stas altern. with the pets. Fr. capsular . **Evonymus.** 129.
 — Stas opp. the pets **9**
 9. Cal.-tube rotate, almost flat. Stipules transformed into
 spines **10**
 — Cal.-tube campanulate. Stips deciduous **11**
 10. Fr. dry, surrounded by a broad wing . . . **Paliurus.** 133.
 — Fr. succulent, not winged **Zizyphus.** 132.
 11. Style 2—4-fid **Rhamnus.** 130.
 — Style entire, stig. capitate **Frangula.** 131.
 12. (6.) Cal. green, persist. **Viola.** 84.
 — Cal. yellow, decid. (fl. yellow) **Impatiens.** 124.
 13 (3). Cor. sup. or half-superior **14**
 — Cor. inferior **20**
 14. Fr. succulent. Shrubs with opp. ls . . . **Lonicera.** 272.
 — Fr. succulent. Herbs with whorled ls . . . **Rubia.** 276.
 — Fr. dry. Herbs with altern. ls **15**
 15. Stas 10, 5 of which are barren. Fls white. **Samolus.** 479.
 — Stas 5. Fls gen. blue (*Campanulaceæ*) **16**
 16. Cor. at first tubular, coherent, then divided to the base,
 in 5 linear lobes **17**
 — Cor. campanulate or campanulate-infundibuliform, rarely
 almost rotate, 5-lobed or -fid with broader lobes . . . **18**
 17. Stas dilated at the base. Fls sessile in a head or spike.
 **Phyteuma.** 361.

- Stas filiform. Fls shortly pedicelled, in head-like umbels
Jasione. 360.
- 18. Cor. rotate with flatly spreading short lobes
Specularia. 364.
- Cor. campanulate or campanulate-infundibuliform . . . **19**
- 19. Style surrounded at the base by an hypog., tubular disk.
Only in Tessin . . . **Adenophora.** 363.
- Style without hypog. disk at the base **Campanula.** 362.
- 20 (13). Ovary (2—)4-partite (in *Heliotropium* undiv.). Fr.
composed of 4 1-seeded nutlets (in *Cerinth* 2 2-seeded)
situated at the base of the cal. (*Boragineæ*) . . . **21**
- Ovary undiv. Fr. a caps., a berry or 2 follicles . . . **34**
- 21. Ovary undiv. during the flowering period **Heliotropium.** 393.
- Ovary 4- (2-) partite during the flowering period . . . **22**
- 22. Throat of the cor. closed by 5 scales which are altern.
with the stas **23**
- Throat of the cor. with no scales, but sometimes with
5 hairy lines or ridges **30**
- 23. Filaments of the stas with a horn-shaped appendage at
the top. Cor. rotate **Borago.** 402.
- Filaments with no appendage **24**
- 24. Cal. enlarged after flowering and forming 2 compressed,
sinuate-dentate lobes, one above the other **Asperugo.** 394.
- Cal. not compressed after flowering **25**
- 25. Carpels with glochidiate prickles **26**
- Carps without prickles **27**
- 26. Carps prickly at the edges. Fls small, blue (like the Forget-
me-not) **Echinospermum.** 395.
- Carps prickly nearly all over. Fls larger, of a dirty blood-red
colour **Cynoglossum.** 396.
- 27. Scales of the throat lanceolate-subulate, conniving like a
cone. Fls never blue **Symphytum.** 405.
- Throat-scales short, obtuse or indented. Fls gen. blue **28**
- 28. Throat-scales pubescent **Anchusa.** 404.
- Throat-scales glabrous **29**
- 29. Carps surrounded by a prominent rim (Pls of the high
Alps.) **Eritrichium.** 397.
- Carps without the rim **Myosotis.** 398.
- 30 (22). Carps 2, 2-seeded. Pl. almost glabr., of a blue-green
colour. Ls cordate (clasping the stem) . . . **Cerinth.** 407.
- Carps 4, 1-seeded **31**
- 31. Cor.-limb irreg. Style 2-fid at the top. Prickly, stiff
haired pls **Echium.** 401.
- Cor.-limb regular **32**
- 32. Cal. 5-toothed or -fid **Pulmonaria.** 406.
- Cal. 5-partite almost to the base **33**
- 33. Cor. cylindric-campanulate, pale-yellow. Anthers sagittate-
2-fid at the base **Onosma.** 400.

- Cor. infundibuliform. Anthers oval or oblong **Lithospermum.** 399.
- 34 (20). Spiny shrubs with altern. ls (comp. *Solanum Dulcamara* and *Vinca*) **Lycium.** 408.
- Herbs **35**
- 35. Ls ternate. Cor. bearded **Menyanthes.** 384.
- Ls not ternate **36**
- 36. Water pls. Ls pectinate-pinnatifid with linear lobes **Hottonia.** 475.
- Land pls **37**
- 37. Stem leafless, terminated by an umbel (often few- or 1-fld), or stem reduced and peduncles radical **38**
- Stem leafy **43**
- 38. Lobes of the cor. laciniate-multifid. Ls rounded-cordate. Alpine pls **Soldanella.** 477.
- Lobes of the cor. not multifid **39**
- 39. Lobes of the cor. rose-red, reflexed. Rt-stock tubercular, globular, or depressed. Ls rounded-cordate angularly sinuate or finely crenate **Cyclamen.** 478.
- Lobes of the cor. not reflexed **40**
- 40. Stas united at the base by a prominent ring. Ls lobed **Cortusa.** 476.
- Stas free. Ls not lobed **41**
- 41. Cor.-tube short, contracted at the throat. Gen. high mountain pls **Androsace.** 472.
- Cor.-tube elongated, dilated near the insertion of the stas. **42**
- 42. Caps. 2-seeded. (High Alpine pls) **Aretia.** 473.
- Caps. many-seeded **Primula.** 474.
- 43 (37). Ls imparipinnate **Polemonium.** 390.
- Ls not pinnate **44**
- 44. Ls opp. or whorled (entire) **45**
- Ls altern. (those of the branches in pairs of which the one is smaller) **49**
- 45. Anthers twisted spirally after shedding pollen **Erythræa.** 389.
- Anthers not twisted after shedding pollen **46**
- 46. Fr. 2 follicles. Ls evergreen. Fls solitary, axillary **Vinca.** 383.
- Fr. a capsule **47**
- 47. Caps. 2—3-celled. Ls evergreen **Azalea.** 371.
- Caps. 1-celled. Ls not evergreen **48**
- 48. Caps. circumsciss, dehiscing by a cap. Cor. never yellow, **Anagallis.** 470.
- Caps. 5-valved. Cor. yellow **Lysimachia.** 469.
- Caps. 2-valved. Cor. gen. blue **Gentiana.** 388.
- 49 (44). Stem twining, climbing or prostrate. Style 2-fid. Cor. campanulate-infundibuliform **Convolvulus.** 391.
- Stem not twining. Style entire **50**
- 50. Anthers 1-celled. Cor. rotate, with rather unequal lobes,

- yellow, seldom white. Filaments of the stas bearded
Verbascum. 416.
- Anthers 2-celled (*Solanaceæ*) **51**
51. Fr. a capsule **52**
- Fr. a berry **54**
52. Fls solitary, l.-axillary. Caps. spiny (like the Horse-chestnut)
Datura. 414.
- Fls in a spike, raceme or panicle **53**
53. Caps. with circumscissile dehiscence. Fls almost sessile
Hyoscyamus. 413.
- Caps. dehiscing longitudinally by 2 valves. Fls pedicelled
Nicotiana. 415.
- 54 (51). Anthers divergent **Atropa.** 412.
- Anthers connivent, at any rate after shedding pollen **55**
55. Anthers dehiscing by 2 terminal pores. Fls in corymb-
like cymes or panicles **Solanum.** 409.
- Anthers dehiscing by longitudinal slits. Fls solitary **56**
56. Cal. with 5 prominent angles and 5 sagittate lobes
Nicandra. 410.
- Cal. much enlarged after flowering, inflated, with 5 teeth
Physalis. 411.
- 57 (2). Perianth superior, infundibuliform, green outside,
white inside. Ls narrow, entire **Thesium.** 497.
- Perianth or cal. inferior **58**
58. 5 barren filaments between the 5 stas. (Ls with scarious
stipules) **59**
- without the barren filaments **60**
59. Lobes of the cal. laterally compressed, keeled at the
back, terminated by a subulate point, white
Illecebrum. 202.
- Cal.-lobes flat-concave, green **Herniaria.** 201.
60. Stig. capitate. Ls or petioles with sheathing stipules
Polygonum. 493.
- Stig. filiform. Ls exstipulate **Chenopodium.** 487.
- 61 (1). Floral envelope composed of cal. and cor. **62**
- Fl. envelope simple (a calyx) **127**
62. Pets 5, superior (*Umbelliferae*) **63**
- Cor. gamopetalous, inferior **123**
63. Umbel simple, or several umbels contracted into the
form of a capitulum so as to form an irreg. branched
umbel (or cyme) **64**
- Umbel reg., compound (umbel and umbellules) **67**
64. Thistle-like pls with spiny-dentate ls **Eryngium.** 215.
- Pls not like thistles **65**
65. Ls orbicular-peltate, crenate **Hydrocotyle.** 212.
- Ls palmati-lobed or -partite, not orbicular-peltate, **66**
66. Fr. covered with numerous hooked prickles. Involucel
very small **Sanicula.** 213.

- Fr. not prickly. Involucel ls large . . . **Astrantia.** 214.
- 67 (63). Ls undiv. and entire. Fls yellow . . . **Bupleurum.** 230.
- Ls 2—3-pinnatipartite or -pinnatisect, or only the rad. ls undivided **68**
- 68. Only 1 vitta under each rib. Fls diœcious, white **Trinia.** 218.
- Vittæ under the furrows or secondary ribs, rarely 0. Fls hermaphrodite or polygamous **69**
- 69. Fls yellow or greenish yellow **70**
- Fls white or rose-coloured, sometimes greenish white **77**
- 70. Invol. and involucels 0, or of 1 leaflet **71**
- Invol. and involucel (at any rate the latter) present **74**
- 71. Fr. orbicular (in transverse section) not winged at the margin **Foeniculum.** 233.
- Fr. flattened dorsally, with a broad (wing-like) or narrower edge **72**
- 72. Pets obcordate **Peucedanum.** 246.
- Pets with 4 rounded angles, truncate **73**
- 73. Ls pluri-pinnatisect, with linear-filiform lobes **Anethum.** 247.
- Ls simply pinnatisect, with oval or oblong lobes **Pastinaca.** 248.
- 74 (70). Fr. compressed laterally. *Parsley* **Petroselinum.** 217.
- Fr. orbicular (in transverse section) or compressed dorsally (parallel to the face of the commissure) **75**
- 75. Fr. fairly orbicular (in transverse section) **Silaus.** 239.
- Fr. compressed dorsally **76**
- 76. Mericarps with 4 secondary ribs with broad wings, so that the fr. appears 8-winged **Laserpitium.** 251.
- Mericarps without secondary ribs. Fr., on account of the compressed, divaricating edges, appearing 2-winged on each side **Levisticum.** 243.
- 77 (69). Inner face of the albumen excavated in the form of a hemisphere **78**
- Inner face of the albumen convex, flat, deeply furrowed or with incurved edges **79**
- 78. Fr. didymous, composed of 2 globular-swollen mericarps **Bifora.** 264.
- Fr. globular **Coriandrum.** 265.
- 79. Invol. and involucels with 0, or few (1—2), ls **80**
- Invol., or at any rate involucels, with many (3—several) ls **86**
- 80. Fr. much compressed dorsally, lentil-shaped **Peucedanum.** 246.
- Fr. orbicular (in transverse section), or compressed laterally **81**
- 81. Pets not indented, pale green. *Celery* **Apium.** 219.
- Pets indented with the tip inflexed **82**

82. Furrows and inner face without vittæ. Ls 2-ternate
Aegopodium. 225.
— Furrows with 1—several vittæ, inner face with 2—many vittæ 83
83. Vittæ clavate. Umbels 3—6-rayed. **Sison.** 223.
— Vittæ not clavate. Umbels 8—40-rayed 84
84. Lower ls simply pinnatisect with broad, toothed or incised divisions (rarely laciniate) **Pimpinella.** 227.
— Ls 2—3-pinnatisect with linear lobes 85
85. Furrows with several vittæ. Carpophore 2-partite. Only in Tessin **Ligusticum.** 238.
— Furrows with 1 vitta. Carpophore 2-fid **Carum.** 226.
- 86 (79). Fr. covered with prickles, bristles or hairs 87
— Fr. glabrous (or almost so) 95
87. Beak of the fr. of a different colour **Anthriscus.** 258.
— Fr. without beak 88
88. Fr. surrounded by a thickened, cartilaginous, white border
Tordylium. 250.
— Fr. without the cartilaginous white border 89
89. Fr. almost orbicular (in transverse section), tomentose or covered with soft hairs 90
— Fr. much compressed, with prickles or stiff bristles 91
90. Fr. ovoid. Lobes of the ls lanceolate **Seseli.** 234.
— Fr. linear-lanceolate. L-lobes linear **Athamanta.** 237.
91. Leaflets of the invol. pinnatifid **Daucus.** 253.
— Leaflets of the invol. entire 92
92. Outer fls with much larger (13—14 mm) petals than those of the centre **Orlaya.** 252.
— Outer fls equal to or little differing from the inner 93
93. Fr. (4—5 mm) thickly covered all over with prickles and bristles **Torilis.** 256.
— Fr. (8—14 mm) with prickles in longitudinal rows 94
94. Secondary ribs equal in height to the primary. Ls simply pinnatisect **Turgenia.** 254.
— Secondary ribs more prominent than the primary. Ls 2—3-pinnatisect **Caucalis.** 255.
- 95 (86). Fr. with a beak at least 3 times as long as the fr. itself
Scandix. 257.
— Fr. without a beak, or with one scarcely half its own length 96
96. Invol. 0, or of 1—2 ls 97
— Invol. of 3—several ls 113
97. Fr. suborbicular or laterally compressed (in transv. section) 98
— Fr. dorsally compressed (parallel to the face of the commissure) 109
98. Ls all simply pinnatisect. Marsh plants
Helosciadium. 220.

- Ls 2—3-ternatisect, with rather large segments. Only in the lower valley of the Rhone **Trochiscanthes**. 236.
- Ls, at any rate the upper ones, 2—several times pinnatisect **99**
- 99. Inner face of the albumen deeply channelled **100**
- Inner face of the albumen flat or almost so (in *Meum* slightly hollowed) **101**
- 100. Ribs of the fr. prominent, sharp. Fr. 20—25 mm long **Myrrhis**. 260.
- Ribs of the fr. obtuse, distinct all over the fr. Fr. 6—10 mm long **Chærophylum**. 259.
- Ribs of the fr. obtuse, visible only at the thin tip of the beak **Anthriscus**. 257.
- 101. Fr. broader than long, almost didymous. Cal. distinctly toothed. Marsh pls **Cicuta**. 216.
- Fr. oblong, oval or almost globular **102**
- 102. Fr. distinctly compressed. Lower ls simply pinnatisect **103**
- Fr. (in transverse section) orbicular or very slightly compressed. Ls 1—several times pinnatisect **104**
- 103. Cal.-teeth obliterated. Fr. ovoid. Vittæ clavate, only reaching about half way down the fr. Only at Geneva **Sison**. 223.
- Cal. with 5 distinct teeth. Fr. oblong. Vittæ not clavate. Only by the lake of Geneva **Ptychotis**. 221.
- 104. Involucel of 3 long leaflets, reflexed outwards **Aethusa**. 232.
- Involucel not reflexed outwards **105**
- 105. Cal.-teeth very distinct on the fr., large. Fr. oblong-cylindric with obtuse ribs. Marsh or water pls **Oenanthe**. 231.
- Cal.-teeth indistinct or short **106**
- 106. Furrows with 3—several vittæ. Inner face with 4—8 vittæ **107**
- Furrows with 1 vitta. Inner face with 2 vittæ **108**
- 107. Pets slightly rolled up at the point, but not indented. Mountain pls with thick fibrous rt-stocks **Meum**. 240.
- Pets indented with an inflexed point. Only in Tess. and the French Jura **Ligusticum**. 238.
- 108. Fr.-ribs with a narrow, almost membranous wing. Cal.-teeth obliterated **Cnidium**. 235.
- Fr. with thick ribs. Cal.-teeth distinct **Seseli**. 234.
- 109 (97). Fr. appearing 2-winged on each side, on account of the lateral divergent wings of the 2 mericarps **110**
- Fr. appearing 1-winged on each side owing to the lateral wings of the 2 mericarps lying one on the other **112**

110. Fr.-ribs all with membranous wings. Pets deeply indented, with an inflexed point. Leaf-segments narrow-lanceolate or linear . . . **Selinum.** 242.
 — The 3 dorsal ribs not winged. Pets not indented, acuminate. Leaf-segments large, broad, oval or oblong. (L. sheaths inflated) . . . **111**
111. Cal.-teeth obliterated. Fls white or rose **Angelica.** 244.
 — Cal.-teeth fairly distinct. Fls greenish **Archangelica.** 245.
- 112 (109). Vittæ not reaching the lower ends of the furrow, clavate . . . **Heracleum.** 249.
 — Vittæ filiform, extending the whole length of the furrow **Peucedanum.** 246.
- 113 (96). Mericarps with 4 winged secondary ribs, the fr. consequently 8-winged . . . **Laserpitium.** 251.
 — Fr. without secondary ribs . . . **114**
114. Albumen deeply channelled on the inner face **115**
 — Albumen flat or raised on the inner face . . . **117**
115. Cal.-teeth obliterated. Furrows without vittæ. Ribs crenate . . . **Conium.** 262.
 — Cal.-teeth distinct. Furrows with 1—2 vittæ. (Stem 10—15 dm) . . . **116**
116. Ribs crenate . . . **Pleurospermum.** 263.
 — Ribs not crenate . . . **Molopospermum.** 261.
- 117 (114). Furrows without vittæ. Alpine pls **Pachypleurum.** 241.
 — Furrows with 1—several vittæ . . . **118**
118. Fr. compressed dorsally, surrounded by a broad wing **Peucedanum.** 246.
 — Fr. (in transverse section) orbicular or laterally compressed . . . **119**
119. Pets entire, not indented, with a straight or inflexed tip. Marsh pls . . . **Helosciadium.** 220.
 — Pets indented, with an inflexed lobule . . . **120**
120. Furrows with 1 vitta . . . **121**
 — Furrows with 3—several vittæ . . . **122**
121. Cal.-limb with 5 distinct teeth. Ls ternatisect **Falcaria.** 222.
 — Cal.-limb obliterated. Invol.-leaflets 3—several-fid . . . **Ammi.** 224.
 — Cal.-limb obliterated. Invol.-leaflets entire **Carum.** 226.
122. Fr. ovoid-oblong; ribs acute, prominent, with narrow wings. Ls several times pinnatisect, with linear segments. Jura . . . **Ligusticum.** 238.
 — Fr. ovoid, almost didymous; ribs filiform. Ls gen. simply pinnatisect, segments lanceolate or oblong. Water pls **122a**
- 122a. Vittæ very numerous, hidden under the thick pericarp. Umbels opp. the ls . . . **Berula.** 228.
 — Vittæ on the surface. Umbels distinctly terminal **Sium.** 229.

- 123 (62). Pls with a filiform, winding stem, without green ls
Cuscuta. 392.
 — Pls with opp. green ls **124**
 124. Two separate follicles, united only by the common
 stigma. See Cl. 16, 4 **Vincetoxicum.** 382.
 — Fr. a 2-valved capsule. (Pl. glabr.) **125**
 125. Divisions of the rotate cor. bearing 2 ciliate glands at
 their base **Sweetia.** 386.
 — Divisions of the cor. without glands **126**
 126. Stigmas decurrent on both sides of the ovary. Cor.
 rotate **Pleurogyne.** 387.
 — Stigmas erect, divergent or reflexed **Gentiana.** 388.
 127 (61). Ligneous pls **128**
 — Herbs **129**
 128. Fr. a samara. Fls in lateral fascicles, appearing before
 the ls **Ulmus.** 508.
 — Fr. a drupe. Fls solitary in the l.-axils, appearing
 with the ls **Celtis.** 509.
 129. Ls opposite **130**
 — Ls alternate **132**
 130. Ls exstipulate, subulate **Scleranthus.** 205.
 — Ls with scarious stipules. See Cl. 5, 58 **131**
 131. Cal.-lobes thick, cartilaginous, white **Illecebrum.** 202.
 — Cal.-lobes flat-concave, green **Herniaria.** 201.
 132 (129). Stipules forming a sheath round the stem
Polygonum. 493.
 — Stipules 0. (Fls in clusters) **133**
 133. Perianth berry-like when mature, juicy (red). (Ls not
 powdery, triangular-sagittate) **Blitum.** 488.
 — Perianth not modified when mature, herbaceous, or
 only slightly fleshy **Chenopodium.** 487.
 134 (1). Ligneous pls. (Fls white or greenish) **135**
 — Herbs **138**
 135. Cor. gamopetalous, superior or half-superior **136**
 — Cor. polypet., inferior **137**
 136. Ls imparipinnate **Sambucus.** 270.
 — Ls undiv. or lobed **Viburnum.** 271.
 137. Ls opp., imparipinnate **Staphylea.** 128.
 — Ls altern., undivided **Rhus.** 134.
 138 (134). Stem leafless. (Ls all radical) **139**
 — Stem bearing ls (at least 1 leaf) **141**
 139. Styles many. Fls greenish yellow **Myosurus.** 6.
 — Styles 3—5 **140**
 140. Ls petioled, with red glandiferous hairs. Fls white, in
 a spike **Drosera.** 86.
 — Ls not petioled, glabr. Fls rose-red, in a terminal head
 surrounded by an invol. of many leaflets **Armeria.** 481.

- 141 (138). Stigs 4. On the inside before each pet., a nectari-
ferous scale, div. into 9—13 glandular hairs **Parnassia.** 87.
- Styles or stigs 3 or 5 **142**
142. Floral envelope a perianth . . . **Polygonum.** 493.
- Fl. envelope composed of cal. and cor. . . . **143**
143. Styles or stigs 3. (Fls white) **144**
- Styles 5 **147**
144. Ls opp. **145**
- Ls altern. **146**
145. Pets denticulate at the tip. Fls almost in an umbel
Holosteum. 108.
- Pets 2-partite **Stellaria.** 109.
146. Styles filiform. Fr. a 3-valved, many-seeded caps.
Telephium. 203.
- Stigs sessile. Fr. 1-seeded, indehiscent **Corrigiola.** 200.
- 147 (143). Ovaries 5 **148**
- Ovary 1 **149**
148. Cal. with 10 divisions. Ls ternate . . . **Sibbaldia.** 172.
- Cal. with 5 divisions. Ls simple, fleshy **Sedum.** 206.
149. Ovary 10-celled **Linum.** 113.
- Ovary 1-celled. (Comp. some Alsinaceæ. Cl. 10, 15.)

Cl. 6. Hexandria.

1. Style 1 **2**
- Styles 2—several, or 0 and then the stigs sessile **32**
2. Floral envelope consisting of cal. and cor. (in *Peplis*
the cor. decid.). Dicotyledons **3**
- Fl. envelope simple or 0. Monocotyledons **7**
3. Prickly shrubs with yellow fls in racemes. Seps 6; pets 6
Berberis. 21.
- Herbaceous pls without prickles **4**
4. Cor. polypet. *) Cal. with 12 teeth **5**
- Cor. gamopet. Cal. never having 12 teeth **6**
5. Cal. campanulate. Style very short . . . **Peplis.** 194.
- Cal. cylindric. Style filiform. Fls red. **Lythrum.** 193.
6. Stas altern. with the cor.-lobes. Ovary with parietal pla-
centæ **Gentiana.** 388.
- Stas opp. the cor.-lobes. Ovary with free central pla-
centæ. (Fls yellow) **Lysimachia.** 469.
- 7 (2). Perianth petaloid (not green) **8**
- Perianth herbaceous or scarious or 0 **29**
8. Perianth sup. (Bulbous pls, with radical ls) **9**
- Perianth inf. **11**

*) Here some *Cruciferae* may be looked for. See Cl. 15.

9. Perianth salver-shaped, with a petaloid crown **Narcissus.** 570.
 — Perianth campanulate or infundibuliform, without the petaloid crown **10**
10. Lobes of the perianth fairly equal in size **Leucojum.** 568.
 — Lobes of the perianth unequal, the 3 inner shorter, indented **Galanthus.** 569.
- 11 (8). Perianth 6-toothed or -fid **12**
 — Perianth with 6 divisions, separated to the base **15**
12. Fls blue or yellow. Fr. a caps. (Ls radical) **13**
 — Fls white. Fr. a berry **14**
13. Bulbous pls. Stem simple. Perianth small (3—5mm), urceolate, blue **Muscari.** 592.
 — No bulb. Stem branched at the top. Perianth large (30—60 mm), infundibuliform (yellow or reddish yellow) **Hemerocallis.** 591.
14. Perianth campanulate. Ls radical **Convallaria.** 574.
 — Perianth tubular. Stem leafy **Polygonatum.** 575
- 15 (11). Style indistinct. Bulbous pls **Tulipa.** 579.
 — Style distinct **16**
16. Top of style 3-fid (3 stigs) **17**
 — Top of style entire (stig. obtuse or 3-lobed) **20**
17. Perianth divisions with a long claw **Bulbocodium.** 593.
 — Perianth divisions without the claw **18**
18. Peduncles articulate. Fr. a berry **Asparagus.** 571.
 — Peduncles not articulate. Fr. a capsule **19**
19. Perianth divisions connivent like a bell **Fritillaria.** 580.
 — Perianth divisions reflexed **Erythronium.** 583.
- 20 (16). Anthers, before emitting pollen, erect (attached to the filament by one end) **21**
 — Anthers versatile (attached to the filament by the middle) **22**
21. Fls white. Pls with a root-stock **Streptopus.** 572.
 — Fls yellow. Pls with bulbs **Gagea.** 588.
22. Peduncles articulate. (Rt fascicled-fibrous) **23**
 — Peduncles not articulate **24**
23. Stas dilated at the base **Asphodelus.** 584.
 — Stas of equal thickness, filiform **Anthericum.** 585.
24. Perianth divisions with a nectary at the base **25**
 — Perianth divisions without a nectary **26**
25. Perianth 8—12 mm long **Lloydia.** 582.
 — Perianth 45—60 mm long **Lilium.** 581.
26. Fls in an umbel, enclosed in a spathe before the anthesis. Pls with a smell of garlic **Allium.** 590.
 — No floral spathe **27**
27. Bulbous pls **28**
 — Pls with fibrousrts **Paradisla.** 586.

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|----------|---|----------------------|-----------|
| 28. | Fls white or yellowish | Ornithogalum. | 587. |
| — | Fls blue | Scilla. | 589. |
| 29 (7). | Fls on a spadix | | 30 |
| — | Fls in a panicle. Juncaceæ | | 31 |
| 30. | Perianth 0. Ls cordate | Calla. | 539. |
| — | Perianth present. Ls ensiform | Acorus. | 540. |
| 31. | Caps. 1-celled, 3-seeded. Ls grass-like, gen. ciliate | | |
| | | Luzula. | 598. |
| — | Caps. more or less completely 3-celled, many-seeded. | | |
| | Ls setaceous, cylindric or 0, glabr. | Juncus. | 597. |
| 32 (1). | Styles numerous. Ls radical | Alisma. | 527. |
| — | Styles 2—3 | | 33 |
| 33. | Floral envelope composed of cal. and cor. Ls opp. Pls | | |
| | growing near water | Elatine. | 112. |
| — | Fl. envelope simple (a perianth) | | 34 |
| 34. | Perianth with an elongated tube springing from the bulb | | |
| | | Colchicum. | 594. |
| — | Perianth without the elongated tube | | 35 |
| 35. | Ls net-veined. Dicotyledons | | 36 |
| — | Ls with straight or curved veins. Monocotyledons | | 38 |
| 36. | Stigs capitate. Lobes of the perianth coloured, almost | | |
| | equal | Polygonum. | 493. |
| — | Stigs tufted, stellate. Lobes of the perianth herbaceous | | |
| | or scarious, the 2 or 3 inner ones enlarged when mature | | 37 |
| 37. | Styles 2. Perianth 4-partite. Fr. lenticular, compressed, | | |
| | with broad wings | Oxyria. | 492. |
| — | Styles 3. Perianth 6-partite. Fr. 3-cornered, not winged | | |
| | | Rumex. | 491. |
| 38 (35). | Perenn. pls with elliptic, folding-nerved ls, and fls | | |
| | in racemes forming a panicle | Veratrum. | 595. |
| — | Low herbs with grass-like ls, and fls in simple racemes | | 39 |
| 39. | Ovary narrowed into the style. Ls distichous, sheathing | | |
| | on opp. sides | Tofieldia. | 596. |
| — | Styles 0. Stig. sessile. Marsh pls | | 40 |
| 40. | Carps united only at the base. Stem leafy | | |
| | | Scheuchzeria. | 530. |
| — | Carps united throughout their whole length. Ls all | | |
| | radical | Triglochin. | 531. |

Cl. 7. **Heptandria.**

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|----|-------------------------------------|-------------------------|
| 1. | Styles 2. Fls yellow. Fr. an achene | Agrimonia. 173. |
| — | Style 1. Fr. a capsule | 2 |
| 2. | Fls yellow | Lysimachia. 469. |
| — | Fls white | Trientalis. 468. |

Cl. 8. Octandria.

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|--|--------------------|
| 1. Style (or stig.) 1 | 2 |
| — Styles (or stigs) 2—4 | 15 |
| 2. Floral envelope composed of cal. and cor. | 3 |
| — Fl. envelope simple | 13 |
| 3. Cor. gamopetalous | 4 |
| — Cor. polypetalous | 9 |
| 4. Cor. inferior | 5 |
| — Cor. superior. (Fr. a berry) | 8 |
| 5. Herbs. Cal. 8-fid | Chlora. 385. |
| — Ligneous pls. Cal. 4-fid or with 4 seps | 6 |
| 6. Trees. Fr. a berry | Diospyros. 375. |
| — Small shrubs. Fr. a capsule | 7 |
| 7. Cor. shorter than the cal. | Calluna. 369. |
| — Cor. longer than the cal. | Erica. 370. |
| 8 (4). Cor. globular-urceolate or campanulate, with 4 (—5) teeth | Vaccinium. 365. |
| — Cor. rotate, 4-partite almost to the base | Oxycoccus. 366. |
| 9 (3). Lig. pls. Fr. a samara | Acer. 120. |
| — Herbs | 10 |
| 10. Pls pale yellow, without green ls. | Monotropa. 374. |
| — Pls with green ls | 11 |
| 11. Ls 2—3-pinnatisect. Cor. inf.; terminal fls with 5 pets | Ruta. 126. |
| — Ls undiv. Cor. superior | 12 |
| 12. Fls red or white. Seed with a tuft of hairs | Epilobium. 184. |
| — Fls yellow. Seed without the tuft of hairs | Oenothera. 185. |
| 13 (2). Stigs 1—2. Ls or petioles with a sheath surrounding the stem | Polygonum. 493. |
| — Stig. 1. Stipules 0 | 14 |
| 14. Perianth decid. Small shrubs | Daphne. 495. |
| — Perianth persist. Herbs | Passerina. 494. |
| 15 (1). Lig. pls. Fls before the ls. | Ulmus. 508. |
| — Herbs | 16 |
| 16. Ls div. or compound | 17 |
| — Ls simple, undivided | 19 |
| 17. Styles 2. Fls in long spiciform racemes | Agrimonia. 173. |
| — Styles 4 | 18 |
| 18. Fls greenish, in a terminal head. Ls 1—2-ternatisect | Adoxa. 269. |
| — Fls rose-coloured, whorled. Ls pectinate-pinnatisect | Myriophyllum. 189. |
| 19 (16). A single fl. at the top of the stem. Fr. a berry | Paris. 573. |
| — Several fls on each stem | 20 |
| 20. Fls yellow | 21 |
| — Fls never yellow | 22 |

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|-----|--|-----------------|------|
| 21. | Cal. 4-fid. Cor. 0 | Chrysosplenium. | 211. |
| — | Cal. and cor. 8-fid | Chlora. | 385. |
| 22. | Fr. 1-seeded, indehiscent. Fl. a perianth. Ls altern. | Polygonum. | 493. |
| — | Fr. a caps. Fl. composed of cal. and cor. Ls opp. or whorled | Elatine. | 112. |
| 23. | Caps. 3-celled | | |
| — | Caps. 1-celled. See Cl. 10, 26. | | |

Cl. 9. Enneandria.

1. Pets 5, yellow. Styles 2 . . . **Agrimonia.** 173.
— Perianth with 6 divisions, rose-coloured. Styles 6
Butomus. 529.
— Perianth 4-partite, white. Style 1 . . . **Laurus.** 496.

Cl. 10. Decandria.

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|---------|--|------------------------|------|
| 1. | Styles 10. Perianth 5-partite. Fr. a berry | Phytolacca. | 490. |
| — | Style 1 | | 2 |
| — | Styles 2—5 | | 10 |
| 2. | Cor. gamopet. Low shrubs | | 3 |
| — | Cor. polypet. (with 5, more rarely 4) separate pets | | 6 |
| 3. | Cor. sup. Fr. a berry | Vaccinium. | 365. |
| — | Cor. inf. | | 4 |
| 4. | Drupe with 5 1-seeded nuts. Cor. 5-toothed | | |
| | | Arctostaphylos. | 367. |
| — | Fr. capsular | | 5 |
| 5. | Cor. ovoid-campanulate, 5-toothed. Caps. loculicidal. | | |
| | Pls growing in peat-bogs | Andromeda. | 368. |
| — | Cor. infundibuliform, 5-fid. Caps. septicidal. Alpine pls | | |
| | | Rhododendron. | 372. |
| 6 (2). | Pl. of a pale yellow colour, with scales instead of green ls | | |
| | | Monotropa. | 374. |
| — | Pls with green ls | | 7 |
| 7. | Ls undiv. | Pyrola. | 373. |
| — | Ls. divided | | 8 |
| 8. | Stigs 5. See Cl. 16, 8 | | |
| — | Stig. 1. (Ls marked with glandular spots) | | 9 |
| 9. | Pets equal, yellow | Ruta. | 126. |
| — | Pets unequal, rose-coloured, veined | Dictamnus. | 127. |
| 10 (1). | Cor. present | | 11 |
| — | Cor. 0 | | 28 |
| 11. | Cor. gamopet. | Adoxa. | 269. |
| — | Cor. polypet. | | 12 |
| 12. | Caps 2-beaked, dehiscing by the inner sutures of the | | |
| | carpels | Saxifraga. | 210. |
| — | Caps. not 2-beaked | | 13 |

13. Ls ternate, leaflets obcordate . . . **Oxalis.** 125.
 — Ls simple, undiv. **14**
14. Fr. composed of follicles, free or separated almost to the base. Styles 5. Ls gen. altern., fleshy **Sedum.** 206.
 — Fr. a caps. (undiv.). Ls always opp. **15**
15. Cal. gamosepalous, 5-toothed or -fid. Pets gen. unguiculate. *Silenaceæ* **16**
 — Cal. with 4—5 seps. Pets not usually unguiculate. *Alsinaceæ* **23**
16. Cal. with 2 or more scaly bracts at the base. Styles 2 **17**
 — Cal. without scales. Styles 2—5 **18**
17. Cal. entirely herbaceous or coriaceous, streaked all over with crowded nerves **Dianthus.** 89.
 — Cal. with membranous commissures Fls small. **Tunica.** 90.
18. Styles 3—5. Cal. with commissural nerves (*i. e.* nerves which run along the margins of 2 united seps, forming part of both) **19**
 — Styles 2. Cal. without commissural nerves **21**
19. Fr. berry-like, indehisc. Fls greenish **Cucubalus.** 94.
 — Fr. a capsule **20**
20. Styles 3 **Silene.** 95.
 — Styles 5 **Lychnis.** 99.
- 21 (18). Cal. cylindric. Pets with a corona **Saponaria.** 93.
 — Cal. campanulate or ovoid-pyramidal, angular. Pets without a corona **22**
22. Cal. 5-cornered. Pets without winged vittæ. Fl. small **Gypsophyla.** 91.
 — Cal. with 5 winged angles. Claws of the pets with 2 winged vittæ **Vaccaria.** 92.
- 23 (15). Ls with scarious stipules **24**
 — Ls without stipules. (Fls white) **25**
24. Styles 3. Caps. 3-valved **Spergularia.** 102.
 — Styles 5. Caps. 5-valved **Spergula.** 101.
25. Pets entire or slightly incised **26**
 — Pets 2-fid or -partite **27**
26. Styles 5. Caps. 5-valved **Sagina.** 103.
 — Styles 3. Caps. 3-valved **Alsine.** 105.
 — Styles 2 **Moehringia.** 106.
27. Styles 3. Caps. 3-valved **Stellaria.** 109.
 — Styles 5. Caps. 10-toothed **Cerastium.** 110.
- 28 (10). Ls rounded-reniform, crenate. Fls yellow **Chrysosplenium.** 211.
 — Ls subulate, entire. Fls greenish **29**
29. Fr. indehisc., 1-seeded **Scleranthus.** 205.
 — Fr. dehisc., many-seeded **Alsine.** 105.

Cl. 11. **Dodecandria.**

1. Styles 6—20. Ls thick, fleshy . . . **Sempervivum.** 207.
- Styles 1—5 **2**
2. Floral envelope composed of cal. and cor. **3**
- Floral envelope simple or 0 **6**
3. Pets multfid. Fr. open at the top . . . **Reseda.** 85.
- Pets undiv. Fr. not open **4**
4. Ls impari- and interruptedly-pinnatisect. Fls yellow, in long spiciform racemes . . . **Agrimonia.** 173.
- Ls undiv., entire **5**
5. Cal. 12-toothed. Pets red **Lythrium.** 193.
- Cal. 2-partite. Pets yellow **Portulaca.** 198.
- 6 (2). Ovary 6-celled. Ls reniform . . . **Asarum.** 500.
- Ovary 3-celled. Ls not reniform . . . **Euphorbia.** 503.

Cl. 12. **Icosandria.**

1. Styles 1—5 **2**
- Styles numerous (more than 5) **16**
2. Floral envelope simple, a 4-fid cal. Fls in terminal heads. Ls pinnate . . . **Sanguisorba.** 176.
- Fl. envelope composed of cal. and cor. **3**
3. Pets numerous, yellow **Opuntia.** 208.
- Pets 4—6, never yellow **4**
4. Cal. sup. (Lig. pls) **5**
- Cal. inf. **14**
5. Style 1. Cor. scarlet. Fr. a many-celled, fleshy berry with a coriaceous envelope . . . **Punica.** 183.
- Styles 2—5, sometimes united at the base, rarely 1 (comp. *Mespylus monogyna*) . . . **6**
6. Ls opp. Pets 4. Capsule . . . **Philadelphus.** 196.
- Ls altern. Pets 5. Fr. a fleshy pseudocarp, formed by the development of the cal.-tube and crowned by the persist. cal.-limb. *Pomaceæ* . . . **7**
7. Cal. with 5 short teeth. Ls entire. Fr. the size of a pea **Cotoneaster.** 178.
- Cal. 5-fid or 5-partite **8**
8. Ls pinnate **Sorbus.** 181.
- Ls undiv. or more or less incised **9**
9. Fls solitary **10**
- Fls in racemes or corymbs **11**
10. Divisions of the cal. toothed. *Quince* . . . **Cydonia.** 179.
- Divisions of the cal. entire. *Medlar* . . . **Mespilus.** 177.
11. Pets long, narrow, lanceolate-cuneiform **Aronia.** 182.
- Pets broad, oval or rounded, or oblong-lanceolate and then rose-coloured **12**

12. Fr. a pear-like drupe (with bony endocarp). Spiny shrubs with large stipules. *Medlar* **Mespilus.** 177.
 — Fr. containing pips (endocarp thin or cartilaginous) **13**
13. Corymb simple, with few fls. (Ls undiv.) **Pyrus.** 180.
 — Corymb branched, with numerous fls **Sorbus.** 181.
- 14 (4). Several follicles opening on the inner side. Perenn. pls with div. ls, or shrubs with simple ls **Spiræa.** 164.
 — Fr. a 1-seeded drupe. Trees or shrubs with undiv. ls. *Amygdalaceæ* **15**
15. Stone marked with small holes. Fls rose (or white), almost sessile **Amygdalus.** 161.
 — Stone smooth or furrowed, but not marked with holes. Fls white, gen. distinctly peduncled **Prunus.** 163.
- 16 (1). Cal.-lobes twice as many as the pets **17**
 — Cal.-lobes equal in number to the pets **21**
17. Styles terminal, persist. (Fr. awned) **18**
 — Styles more or less lateral, decid. **19**
18. Style (awn of the fr.) articulate. Stem bearing several fls **Geum.** 166.
 — Style not articulate. Stem 1-fl'd (fl. yellow) **Sieversia.** 167.
19. Fr. receptacle succulent when mature, detaching itself from the calyx. Ls ternate. *Strawberry* **Fragaria.** 169.
 — Receptacle not detaching itself from the calyx **20**
20. Pets persist., lanceol., dark purple. Marsh pls **Comarum.** 170.
 — Pets decid., rounded, obcordate or oval, yellow, white, or rose-coloured **Potentilla.** 171.
- 21 (16). Cal.-lobes (and pets) 8—9. Ls simple, undiv. **Dryas.** 165.
 — Cal.-lobes 5. Ls divided or compound **22**
22. Carps dehiscent, 2—several-seeded. Ls interruptedly pinnatisect **Spiræa.** 164.
 — Carps indehisc., 1-seeded. Ls digitate or pinnate **23**
23. Carps enclosed in the cal. tube, which has become fleshy and narrowed at the throat (appearing like an inf. ovary) **Rosa.** 174.
 — Carps on a flat or swollen receptacle, appearing like a false berry **Rubus.** 168.

Cl. 13. Polyandria.

1. Style 1 or 0 **2**
 — Styles 2—several. (*Ranunculaceæ*) **11**
2. Fls spurred, blue **Delphinium.** 17.
 — Fls not spurred **3**
3. Pets numerous. Water pls with large floating ls . **4**
 — Pets 4—5 **5**
4. Seps 4. Pets white **Nymphæa.** 23.
 — Seps 5. Pets yellow **Nuphar.** 24.

5. Seps 2 (decid.). Pets 4 **6**
- Seps 3—5. Pets 4—6 **8**
6. Caps. globular, obovate or clavate, with 5—20 incomplete cells opening by as many holes, arranged in a circle under the 5—20-rayed stigmatic disk **Papaver. 25.**
- Caps. elongated, linear (in the form of a siliqua), 2-valved. Stig. 2-lobed **7**
7. Fls solitary, large **Glaucium. 26.**
- Fls umbelled, smaller **Cheledonium. 27.**
- 8 (5). Ls 2-ternatisect **Actea. 19.**
- Ls undiv. **9**
9. Trees. Common peduncle united to a net-veined bract.
Lime **Tilia. 117.**
- Herbs or small shrubs **10**
10. Caps. 3-valved. Style distinct **Helianthemum. 83.**
- Caps. 5-valved. Style almost 0 **Cistus. 82.**
- 11 (1). Fls irreg. **12**
- Fls reg. **13**
12. The upper sep. spurred **Delphinium. 17.**
- The upper sep. in the form of a casque **Aconitum. 18.**
13. Ls opp. **14**
- Ls altern., whorled or radical **15**
14. Pets numerous. Fls solitary. Ls 2-ternate **Atragene. 2.**
- Pets 0. Fls in a panicle. Ls pinnate **Clematis. 1.**
15. Pets all prolonged to a spur below. Ls 2-ternate
Aquilegia. 16.
- Pets not prolonged to a spur **16**
16. Floral envelope simple (a petaloid calyx) **17**
- Floral envelope double, the inner circle (the petals) often very small **19**
17. Stem with 3 whorled ls, otherwise leafless. Gen. spring fls
Anemone. 4.
- Stem with altern. ls, rarely leafless **18**
18. Fls small, numerous. Ls several times divided
Thalictrum. 3.
- Fls large, solitary. Ls undivided **Caltha. 10.**
- 19 (16). Pets small, of a peculiar form, nectariform **20**
- Pets normal, as large or larger than the seps **24**
20. Seps 6—several. (Fls yellow) **21**
- Seps 5 **22**
21. Seps numerous. Pets flat, resembling stas **Trollius. 11.**
- Seps 6. Pets tubular **Eranthis. 12.**
22. Fls blue or whitish. Carps united at the base or up to the centre **Nigella. 15.**
- Fls never blue. Carps free or united only at the base **23**
23. Pets unilabiate. Ls 2-ternate **Isopyrum. 14.**
- Pets bilabiate. Ls pedate, with 7—12 segments
Helleborus. 13.

- 24 (19). Seps 3 25
 — Seps more than 3 (gen. 5) 26
 25. Cor. yellow. Stem leafy *Ficaria*. 9.
 — Cor. never yellow. Stem leafless *Anemone*. 4.
 26. Carps 2—5, many-ovuled, dehisce. Stem 1-fl'd *Pæonia*. 20.
 — Carps numerous (rarely only 7—5), 1-seeded, indehisc. 27
 27. Pets with honey spots at their bases . . . *Ranunculus*. 8.
 — Pets without honey-spots *Adonis*. 5.

Cl. 14. *Didynamia*.

1. Fr. separating into 4 1-seeded nutlets. Ls always opp. *Gymnospermia* L. 2
 — Fr. a 1—3-celled caps. Ls opp., altern., or 0. *Angiospermia* L. 27
 2. Style terminal, simple, or indistinctly and obliquely 2-lobed. Some of the ls pinnatifid . . . *Verbena*. 465.
 — Style inserted at the base between the carps, 2-fl'd at the top. *Labiatae* 3
 3. Cor. with 4 almost equal lobes *Mentha*. 436.
 — Cor. unilabiate, *i. e.* the upper lip very small, or cleft, with the lobes bent down on the lower lip . . . 4
 — Cor. distinctly bilabiate 5
 4. Lower lip of the cor. 3-fl'd *Ajuga*. 463.
 — Lower lip of the cor. 5-fl'd *Teucrium*. 464.
 5. Stas bent down on the lower lip of the cor. Cal. apparently without teeth *Lavandula*. 435.
 — Stas erect, ascending, or curved outwards . . . 6
 6. Stas and style enclosed in the cor.-tube 7
 — Stas (or at any rate style) exceeding the throat of the cor. 8
 7. Cal. 10-toothed. Fls white *Marrubium*. 457.
 — Cal. 5-toothed. Fls yellow *Sideritis*. 456.
 8. Fls solitary in the axils of imbricated bracts, and united in dense spikes, crowded together at the tops of branches *Origanum*. 439.
 — Fls in short cymes (in the axils of ls) of which 2 opposite ones form a false whorl 9
 9. Cal. bilabiate 10
 — Cal. 5-toothed 16
 10. Stas separated in pairs and either diverging above or conniving below the upper cor.-lip 11
 — Stas close together in pairs, conniving below the upper cor.-lip 14
 11. Stas diverging towards the top. Ls entire *Thymus*. 490.
 — Stas conniving above 12

12. Cal. cylindric-tubular **Calamintha.** 443.
— Cal. enlarged-campanulate, with a flat limb **13**
13. Cor.-tube with a ring of hairs inside. Fls violet
Hormium. 445.
— Cor.-tube without the ring of hairs inside. Fls white
Melissa. 444.
14 (10). Both the cal.-lips entire, the upper one with a scale
on the back **Scutellaria.** 461.
— Lower cal.-lip 2-fid, upper 3-dentate **15**
15. Cal. closed at maturity. Fls 3 together in the axils of
scarious bracts, forming a short spike **Brunella.** 462.
— Cal. open at maturity. Fls 1—3 together in the axils
of ordinary ls **Melittis.** 450.
16 (9). The 2 upper (inner) stas longer than, or at any rate
exceeding the 2 lower (outer) **17**
— The 2 lower (outer) stas longer than, or at any rate
exceeding the 2 upper (inner), (in Leonurus the 2 upper
reaching higher, the 2 lower rather longer) **19**
17. The upper lip of the cor. swollen in the form of a
casque. Fls large, violet or blue . **Dracocephalum.** 449.
— Upper lip of the cor. flat **18**
18. Middle lobe of the lower lip of the cor. flat. Anthers in
pairs, their cells forming a cross . . . **Glechoma.** 448.
— Middle lobe of the lower lip of the cor. concave. Anther
cells not forming a cross **Nepeta.** 447.
19 (16). Stas separated, divergent above . **Hyssopus.** 446.
— Stas separated, connivent beneath the upper lip . **20**
— Stas close together under the upper lip, parallel (the
2 longest sometimes bent outwards after emitting pollen) **21**
20. Cal. campanulate, 10-nerved **Satureja.** 441.
— Cal. tubular, 13-nerved. **Micromeria.** 442.
21. Ls palmatilobed, with 3—5 lobes . . . **Leonurus.** 459.
— Ls undivided **22**
22. Lower lip of the (red or white) cor. with a broad, ob-
cordate middle lobe, the lateral lobes very small, sub-
ulate **Lanium.** 451.
— Lower lip of the (yellow) cor. with 3 pointed, entire
lobes **Galeobdolon.** 452.
— Lower lip of the cor. with 3 broad, obtuse lobes **23**
23. Lower lip with 2 hollow lumps at its base **Galeopsis.** 453.
— Lower lip without the hollow lumps **24**
24. The 2 longer stas bent down outwards after emitting
pollen **Stachys.** 454.
— The longer stas not bent down outwards after emitting
pollen **25**
25. Stas almost equal in length, only as long as the cor.-tube
Chaiturus. 460.
— Stas unequal in length **26**

26. Fls in sessile clusters, united in a spike **Betonica.** 455.
— Fls in clusters on peduncles 2—5 *mm* long, distant or the upper ones near together . . . **Ballota.** 458.
- 27 (1). Cor. sup., almost reg. 5-fid. Ovary 3-celled.
Linnæa. 273.
— Cor. inf. Ovary 1—2-celled 28
28. Parasitic pls, never green, the ls reduced to scales 29
— Green pls, with ls (*Scrophulariaceæ*) 31
29. Raceme unilateral. Scales opp. **Lathræa.** 432.
— Fls in a spike, on all sides. Scales altern. 30
30. Seps 2, 2-fid or entire, sometimes united in front. Fl. with 1 bract **Orobanche.** 434.
— Cal. gamosep., campanulate, with 4—5 divisions or teeth. Fl. with 3 bracts **Phelipæa.** 433.
- 31 (28). Caps., by suppression, 1-celled, 1-seeded. Cor. yellow, with 5 almost equal lobes. Ls opp. **Tozzia.** 428.
— Caps., at any rate at the base, 2-celled, several- or many-seeded 32
32. Cal. with 4 teeth or divisions. (Upper lip of the cor. in the form of a casque) 33
— Cal. with 5 teeth or divisions, or bilabiate, and the lips often irreg. incised 36
33. Cal. inflated, laterally compressed, Ls opp., crenate-dentate, sessile. Fls yellow **Alectorolophus.** 426.
— Cal. tubular or campanulate, not inflated 34
34. Caps.-cells 1—2-seeded: seed smooth. Ls entire
Melampyrum. 429.
— Caps.-cells several-seeded: seeds streaked longitudinally 35
35. Seeds with unequal ribs, rather broadly winged. Perenn. pls (Alpine) **Bartsia.** 430.
— Seeds with equal ribs, not, or narrowly, winged. Ann. pls **Euphrasia.** 431.
- 36 (32). Peduncle radical. Cor. with 5 almost equal lobes
Limosella. 422.
— Peduncle not radical 37
37. Cor. with a spur or lump at the base 38
— Cor. with no spur or lump 40
38. Throat of the cor. open. Caul. ls 2—7-fid **Anarrhinum.** 420.
— Throat of the cor. more or less closed by the prominent palate in the middle of the lower lip 39
39. Cor. with a conic-subulate spur **Linaria.** 418.
— Cor. with a short obtuse swelling. Ls undiv., entire. Fls red
Antirrhinum. 419.
- 40 (37). Upper lip of the cor. in the form of a casque. Ls pinnatisect **Pedicularis.** 427.
— Upper lip of the cor. not in the form of a casque 41

41. Ls opp. Cor. small, almost globular, with a scale-like appendage under the upper lip (staminode, rudiment of a 5th stamen) **Scrophularia.** 417.
 — Ls altern. (undiv.) **42**
 42. Fls yellow, in long spiciform racemes. Cor. campanulate or tubular-campanulate **Digitalis.** 425.
 — Fls red, in corymbiform racemes (finally elongated). Cor. infundibuliform, the limb almost flat **Erinus.** 424.

Cl. 15. Tetradynamia.

This class includes all the **Cruciferae**: pets and seps 4. Inflorescence, at first in a corymb, developing by degrees into a raceme through the prolongation of the axis. Peduncles gen. ebracteate.

1. Fr. a silicule, *i. e.* not longer or not much longer than it is broad. *Siliculosæ* **2**
 — Fr. a siliqua, *i. e.* distinctly longer than broad. *Siliquosæ* **32**
 2. Silicule with 2 transverse partitions; the lower article resembling a peduncle; the upper almost globular **Rapistrum.** 79.
 — Silicule without these 2 transverse partitions **3**
 3. Silicule not, or very slightly compressed **4**
 — Silicule much compressed **15**
 4. Fls yellow **5**
 — Fls white **11**
 5. Silicule 1-celled, 1-seeded **Neslea.** 75.
 — Silicule 2—4-celled **6**
 6. Silicule 4-celled and 4-cornered, the corners winged and toothed **Bunias.** 77.
 — Silicule neither winged nor toothed **7**
 7. Silicule 3-celled, the 2 upper cells juxtaposed, empty, the lower cell 1-seeded **Myagrum.** 74.
 — Silicule 2-celled **8**
 8. Stas with a lump or tooth at the base **Versicaria.** 51.
 — Stas with no tooth **9**
 9. Silicule indehisc., with 2 1-seeded cells placed obliquely **Lælia.** 78.
 — Silicule dehisc., 2-valved, with 2 many-seeded, juxtaposed cells **10**
 10. Silicule obovate or pear-shaped. Caul. ls sagittate at the base **Camelina.** 62.
 — Silicule globular or elliptic. Caul. ls narrowed at the base, rarely slightly auricled **Nasturtium.** 32.
 11 (4). The longer stas bent (knee-shaped) about the middle. Silicules almost globular **Kenera.** 60.
 — Stas not bent **12**
 12. Silicule 1-celled, 1-seeded **Calepina.** 76.

—	Silicule 2-celled, with 2—several seeds		13
13.	Silicule pubescent, 2-seeded	Euclidium.	72.
—	Silicule glabrous, several-seeded		14
14.	Valves nerveless	Armoracia.	61.
—	Valves 1-nerved	Cochlearia.	59.
15 (3).	Fls white, lilac or red		16
—	Fls yellow		28
16.	Silicules indehisc. Racemes opp. the ls. Ls pinnatipartite	Senebiera.	71.
—	Silicules dehisc. Racemes terminal		17
17.	Pets unequal, the 2 outer ones distinctly larger		18
—	Pets equal		19
18.	Stas with an appendage. Stem leafless	Teesdalea.	64.
—	Stas without the appendage. Stem leafy	Iberis.	65.
19.	Silicules very large (35—60 mm), stipitate, <i>i. e.</i> supported on the peduncle by another stalk. Fls lilac or purplish	Lunaria.	55.
—	Silicules smaller (at most 15 mm), not stipitate		19a
19a.	Pets 2-fid (white)		20
—	Pets entire or only slightly indented		21
20.	Stem leafy. Stas short, with a distinct tooth	Berteroa.	53.
—	Stem leafless. Stas with no tooth	Erophila.	58.
21.	Partition much narrower than the broadest diameter of the silicule		22
—	Partition as broad or almost as broad as the broadest diameter of the silicule		27
22.	Long stas winged, toothed. Fls lilac or purple	Aethionema.	70.
—	Stas not toothed		23
23.	Cells of the silicule 1-seeded	Lepidium.	67.
—	Cells of the silicule with 2—several seeds		24
24.	Fls violet	Thalaspi.	63.
—	Fls white		25
25.	Valves winged, with concave wings	Thalaspi.	63.
—	Valves not winged		26
26.	Cells of the silicule 2-seeded	Hutchinsia.	68.
—	Cells of the silicule with numerous seeds	Capsella.	69.
27 (21).	Fls rose-coloured. Ls 3-fid	Petrocallis.	56.
—	Fls white. Ls entire	Draba.	57.
28 (15).	Stem leafless	Draba.	57.
—	Stem leafy		29
29.	Partition as broad as the broad est diameter of the silicule. (Pl. more or less gray, on account of the small stellate hairs)		30
—	Partition much narrower than the broadest diameter of the silicule		31
30.	Silicules 1-celled, 1-seeded, pendant	Clypeola.	54.

- Silicules 2-celled, with 2—several seeds, not pendant **Alyssum.** 52.
- 31. Silicules indented above and below (like spectacles), 2-celled, 2-seeded **Biscutella.** 66.
- Silicules oblong-cuneiform, 1-celled, 1-seeded **Isatis.** 73.
- 32 (1). Siliquas indehisc., or separating transversely by articles. (Ls lyrate) **33**
- Siliquas opening by 2 valves **34**
- 33. Siliquas contracted between the seeds like a string of beads, and separating at last into 1-seeded articles **Raphanistrum.** 80.
- Siliquas inflated, spongy at maturity, very slightly or not at all contracted between the seeds and not separating at maturity. *Radish* **Raphanus.** 81.
- 34. Fls yellow or yellowish **35**
- Fls white, lilac or red **45**
- 35. Seeds 1-seriate in each cell **36**
- Seeds 2-seriate (sometimes rather indistinctly) in each cell **44**
- 36. Stig. 2-lobed, with reflexed lobes. Ls entire **Cheiranthus.** 31.
- Stig. obtuse or indented **37**
- 37. Valves 1-nerved (on the side of the strong dorsal nerve there are often reticulated veins resembling indistinct lateral nerves) **38**
- Valves 3—5-nerved (nerves gen. strong and straight) **43**
- 38. Ls all undiv., only dentate or sinuate-dentate **39**
- Ls all, or at least the lower ones, lyrate-pinnatipartite, or simply 2—3-pinnatisect **40**
- 39. Siliquas 4-cornered. Seeds rather long. Pls with, gen. branched, hairs **Erysimum.** 45.
- Siliquas cylindric. Seeds globular. Pls glabr. or with simple hairs **Brassica.** 46.
- 40. Seeds globular **Brassica.** 46.
- Seeds ovoid or elliptic **40a**
- 40a. Ls 2—3-pinnatisect, with linear segments **Sisymbrium.** 39.
- Ls with other characteristics **41**
- 41. Racemes arranged in a corymb. Siliquas not more than 15 mm in length. Alpine pls **Hugueninia.** 41.
- Racemes solitary. Siliquas more than 15 mm long **42**
- 42. Pls glabrous **Barbarea.** 33.
- Pls more or less hairy **Erucastrum.** 48.
- 43 (37). Siliquas terminating in a beak 10—20 mm long. Seeds globular **Sinapis.** 47.
- Siliquas without, or with a very short, beak. Seeds ovoid or elongated **Sisymbrium.** 39.
- 44 (35). Siliquas compressed. Valves 1-nerved **Diplotaxis.** 49.

- Siliquas inflated. Valves gen. without nerves **Nasturtium.** 32.
- 45 (34). Seeds 1-seriate in each cell **46**
- Seeds 2-seriate in each cell **54**
- 46. Stig. composed of 2 erect laminae laid one against the other **47**
- Stig. obtuse or indented **48**
- 47. Laminae of the stig. with a horn on the back. Pls gray-tomentose **Matthiola.** 30.
- Laminae of the stig. flat. Green pls **Hesperis.** 38.
- 48. Valves without nerves, or with a faint rudimentary nerve at the base **49**
- Valves with 1—3 nerves, in *Arabis alpina* faintly 1-nerved or almost nerveless; comp. also *Stenophragma* **50**
- 49. Root-stock covered with scales or teeth. Rad. ls 0 **Dentaria.** 37.
- Rt-stock without scales or teeth. Rad. ls gen. present **Cardamine.** 36.
- 50. Ls entirely glabr., glaucous, the caul. cordate-sagittate at the base, entire **51**
- Ls more or less hairy, or if glabr., not glaucous, gen. toothed, sinuate or pinnatifid **52**
- 51. Siliquas spreading, 4-cornered, 9—12 cm **Conringia.** 44.
- Siliquas erect-spreading, compressed 4-cornered, 5—8 cm **Arabis.** 35.
- 52. Siliquas 4-cornered. Valves 3-nerved. Pls having a smell of garlic **Alliaria.** 40.
- Siliquas compressed. Valves 1-nerved **53**
- 53. Ls undiv. Siliquas with narrow partitions. Ann. pls. Caul. ls narrowed towards the base **Stenophragma.** 43.
- Ls undiv. or lyrate-runcinate. Siliquas with broad partitions. Perenn., ann., or bienn. pls, but, in this case, caul. ls cordate or sagittate at the base **Arabis.** 35.
- Caul. ls pinnatipartite, with 2—4 pairs of linear segments. Siliquas with broad partitions. Perenn. pls **Sisymbrium.** 39.
- 54 (45). Fls in leafy racemes **Braya.** 42.
- Fls in leafless racemes **55**
- 55. Siliquas terminated by a compressed beak (almost equaling them in length) **Eruca.** 50.
- Siliquas with a short beak or 0 **56**
- 56. Siliquas erect-applied, much compressed, about 6 times as long as the peduncle (60—80 mm). Caul. ls sagittate, entire **Turritis.** 34.
- Siliquas spreading, cylindric, about as long as the peduncle (at most 50 mm), Caul. ls pinnatisect **Nasturtium.** 32.

Cl. 16. **Monadelphia.**

1. Stas 5 2
- Stas more than 5 5
2. Ls undiv., entire 3
- Ls palmatilobed or pinnatilobed 10
3. Fls yellow **Lysimachia.** 469.
- Fls never yellow 4
4. Cor. 5-partite, the throat closed by a corona. Ls always opp. **Vincetoxicum.** 382.
- Cor. with 5 pets, without a corona. Ls gen. altern. **Linum.** 113.
- 5 (1). Perianth with 6 divisions. Stas 6 **Allium.** 590.
- Cor. reg., in *Erodium* the pets rather unequal 6
- Cor. irreg. 11
6. Shrubs, with small ls, the seed with a tuft of hairs. Stas 10, the altern. ones shorter **Myricaria.** 195.
- Herbs 7
7. Ls composed of 3 obcordate leaflets. Stas 10, the altern. ones shorter **Oxalis.** 125.
- Ls palmati-lobed or -partite. (Fls never yellow) 8
8. Stas numerous. Fls with a calyx-like envelope (outer cal.). **Malvaceæ** 9
- Stas 10. Fls with no outer calyx. **Geraniaceæ** 10
9. Outer cal. with 3 leaflets **Malva.** 115.
- Outer cal. 6—9-fid **Althæa.** 116.
10. Awns of the carps rolled up spirally. Inflorescence a many-fid umbel **Erodium.** 123.
- Awns of the carps rolled up in a circle (in the same plane). Inflorescence 2- (rarely 1-)fid **Geranium.** 122.
- 11 (5). Seps 5, 2 of which are larger, petaloid (wings). Ls undiv., entire **Polygala.** 88.
- Cal. gamosep. with 5 teeth, 5-fid, or bilabiate. Part of the **Papilionaceæ** 12
12. Ls imparipinnate (the first sometimes almost simple) **Anthyllis.** 140.
- Ls simple or ternate 13
13. Cal. 5-fid. Keel narrowed to a beak. Leaflets toothed **Ononis.** 139.
- Cal. unilabiate or bi-labiate. Keel obtuse or only slightly pointed. Ls or leaflets entire. (Fls yellow) 14
14. Pod scarcely longer than the cal. Cal. div. to the base into 2 lips **Ulex.** 135.
- Pod exceeding the calyx 15
15. Stig. capitate, terminal, at the top of the style, which is long, and rolled up in a circle **Sarothamnus.** 136.
- Stig. oblique at the top of the style 16
16. Ls simple **Genista.** 137.
- Ls ternate **Cytisus.** 138.

Cl. 17. **Diadelphia.**

1. Seps 5, persist.; 2 larger than the others, coloured (wings). Stas 8, united in bundles of 4. Ls undiv., entire
Polygala. 88.
- Seps 2, decid. Stas 6, in bundles of 3. Ls 2-ternatisect or 2—3-pinnatisect **2**
- Cal. gamosep., persist. Stas 10, 9 united and 1 free. Ls pinnate or digitate, rarely simple (cor. papilionaceous). Here are found nearly all the *Papilionaceæ* **3**
2. Fr. an indehisc. nut, oval or globular, 1-seeded. Fls small (5—12 mm) **Fumaria. 29.**
- Fr. a long, silicular, several-seeded caps., opening by 2 valves. Fls larger **Corydalis. 28.**
3. Ls all simple, entire **Lathyrus. 160.**
- Ls digitate, with 3 leaflets (sometimes large stipules resembling leaflets make them appear to have 5 leaflets, or to be pinnate) **4**
- Ls imparipinnate (with a terminal leaflet; leaflets gen. more than 7) **10**
- Ls paripinnate (sometimes with only 1 pair), (the terminal leaflet replaced by a tendril, a point or a spine) **19**
4. Keel rostrate. (Leaflets entire) **5**
- Keel obtuse **6**
5. Pod 4-winged. Fls yellow or red, single or in pairs
Tetragonolobus. 147.
- Pod not winged. Fls yellow, in head-shaped umbels of 3—12 fls **Lotus. 146.**
6. Stipules large, resembling the leaflets and forming with them a 5-digitate leaf. Fls small, gen. with a dark-blue keel. Leaflets entire **Dorycnium. 145.**
- Stipules not resembling the leaflets **7**
7. Cor. withering persist. Pod gen. enclosed. Clover
Trifolium. 144.
- Cor. decid. Pod reaching beyond the calyx **8**
8. Cotyledons sessile or narrowed into the petiole without a joint. Pod reniform, sickle-shaped or rolled spirally
Medicago. 141.
- Cotyledons joined to the petiole by a joint **9**
9. Pods linear or oval-oblong, but then beaked and the fls blue. Fls blue, in head-like racemes with long peduncles, or yellow in almost sessile umbels **Trigonella. 142.**
- Pods oval, not beaked. Fls yellow or white, in long racemes **Melilotus. 143.**
- 10 (3). Fls solitary. Leaflets toothed **Cicer. 158.**
- Fls in umbels. Leaflets entire **11**
- Fls in racemes or spikes **13**
11. Keel obtuse **Ornithopus. 154.**

- Keel rostrate (beaked) **12**
- 12. Pod cylindric or 4-cornered, contracted at the joints
Coronilla. 153.
- Pod compressed, with deep notches on the inner (upper)
 edge **Hippocrepis.** 155.
- 13 (10). Style pubescent. Lig. pls **14**
- Style gen. glabr. Herbaceous or suffrutescent pls **15**
- 14. Pod inflated. Racemes 3—6-fld. Fls yellow. Ls with
 3—5 pairs of leaflets **Colutea.** 148.
- Pod compressed. Racemes many-fld. Fls white or red.
 Ls of 5—10 pairs of leaflets **Robinia.** 149.
- 15. Pod 1-seeded, with prickly teeth. Wings very short
 (3 mm). *Sainfoin* **Onobrychis.** 157.
- Pod several-seeded **16**
- 16. Pod with cells separated transversely, dividing at last
 into 1-seeded joints **Hedysarum.** 156.
- Pod with 1 cell, or with 2 cells separated longitudinally
16a
- 16a. Keel composed of 2 separate pets. Stipules 0
Glycyrrhiza. 147*
- Keel of 2 united pets **17**
- 17. Keel with an aciculate point under the obtuse tip
Oxytropis. 151.
- Keel without this point. **18**
- 18. Pod 1-celled, inflated, stipitate in the calyx. Fls yellow
Phaca. 150.
- Pod imperfectly 2-celled, through the inflection of the
 upper suture **Astragalus.** 152.
- 19 (3). Petiole ending in a spine **Astragalus.** 152.
- Petiole ending in a tendril or soft point **20**
- 20. Sta.-tube cut obliquely at the top (*i. e.* the free part
 of the upper sta. much longer than that of the lower)
Vicia. 159.
- Sta.-tube cut straight (the free part of all the stas
 of the same length) **Lathyrus.** 160.

Cl. 18. Polyadelphia.

Here are found all the **Hypericaceæ**: seps and pets 5 (yellow); stas numerous. Styles 3. Ls opp. or whorled, undiv., entire, often marked with transparent spots.

- 1. Stas 3-adelphous. Seps almost equal **Hypericum.** 119.
- Stas 5-adelphous. Seps unequal **Androsæmum.** 118.

Cl. 19. Syngenesia.

Here are found all the **Compositæ**: Fls in heads surrounded by a common involucre. Stas gen. 5, the anthers united in a tube round the 2-fid style.—Not to be confused with the **Compositæ** are the family **Dipsacæ** (Cl. 4); the genera **Jasione** and **Phyteuma** of the family **Campanulacæ** (Cl. 5); **Xanthium** (Cl. 21); **Armeria** (Cl. 5) and **Globularia** (Cl. 4).

1. Fls all ligulate. *Ligulifloræ* 2
- Fls all tubular. *Tubulifloræ* 25
- Inner fls (disk florets) tubular, the outer ones ligulate and forming a ray. *Radiifloræ* 56
2. Pappus 0, or forming a crown-like edging, or composed of short scarious chaff 3
- Pappus (at any rate that of the fr. of the disk) hairy or plumose 6
3. Fls blue **Cichorium.** 338.
- Fls yellow 4
4. Stem leafy, with several or many heads **Lampsana.** 335.
- Stem leafless, with 1—3 heads 5
5. Involucral bracts conniving, after flowering, almost in a globe **Arnoseris.** 337.
- Invol. bracts erect, even after flowering **Aposeris.** 336.
- 6 (2). Part, at any rate, of the pappus plumose (the hairs bearing 2 rows of lateral hairs) 7
- Pappus hair-like (the hairs simple, without or with small, extremely short, teeth) 14
7. Receptacle with decid. chaff between the fls
Hypochæris. 346.
- Recept. without chaff 8
8. Plumes of the pappus intermingled 9
- Plumes of the pappus free. (Fls yellow). 11
9. Involucral bracts in 1 row (almost equal in length).
Fr. with a long beak. Ls entire . . . **Tragopogon.** 343.
- Invol. bracts in several rows (imbricate). Fr. not beaked
10
10. Fr. with a swelling at the base thicker than the fr. itself.
Ls gen. pinnatifid **Podospermum.** 345.
- Fr. with a short, scarcely visible, swelling at the base.
Ls undiv. **Scorzonera.** 344.
- 11 (8). Stem leafless 12
- Stem leafy 13
12. Pappus of the marginal fr. short, crown-like
Thrinicia. 339.
- Pappus of all the fr. plumose, or that of the marginal fr. formed of simple hairs . . . **Leontodon.** 340.
13. Fr. terminated by a long filiform beak. Invol. bracts in 2 rows, the outer ones larger, cordate-oval
Helminthia. 342.

- Fr. slightly thinner below the pappus, but with no beak.
Invol. bracts imbricate, the outer ones linear-lanceolate
Picris. 341.
- 14 (6). Heads containing 5 fls, fls in a single row . . . **15**
- Heads with more fls, fls in several rows . . . **16**
- 15. Fr. beaked. Fls yellow . . . **Phoenixopus.** 352.
- Fr. not beaked. Fls red . . . **Prenanthes.** 350.
- 16. Fr. beaked . . . **17**
- Fr. not beaked, at most only slightly narrowed towards
the top . . . **21**
- 17. Fr. with tubercles or spiny scales towards the top. (Fls
yellow) . . . **18**
- Fr. with neither scales nor tubercles. (Stem leafy) **20**
- 18. Scales or spines scattered, not united in a crown. Stem
leafless . . . **Taraxacum.** 348.
- Scales or spines united in a small 5-toothed crown round
the base of the beak . . . **19**
- 19. Heads 7—12-fld. Stem leafy . . . **Chondrilla.** 349.
- Heads many-fld. Stem leafless or with 1—2 ls
Willemetia. 347.
- 20 (17). Fr. flat-compressed, all with filiform beaks
Lactuca. 351.
- Fr. not compressed, the outer ones without, or with a
shorter, beak . . . **Barkhausia.** 355.
- 21 (16). Fls blue . . . **Mulgedium.** 353.
- Fls yellow or yellowish-red . . . **22**
- 22. Fr. much compressed . . . **Sonchus.** 354.
- Fr. not, or only slightly, compressed . . . **23**
- 23. Pappus dirty-white, stiff, brittle. Fr. of the same width
all the way up, or broader towards the top
Hieracium. 358.
- Pappus gen. white, soft, supple (rarely rather dirty-
white*) . . . **24**
- 24. Fr. becoming thinner towards the top, or narrowed into
a short beak. Pappus hairs in several rows **Crepis.** 356.
- Fr. entirely without a beak (as in *Hieracium*). Pappus-
hairs in 1 row. (Stem leafless. Ls glabrous)
Chlorocrepis. 357.
- 25 (1). Heads 1-fld (each fl. with a separate invol.), crowded
in a globular head . . . **Echinops.** 322.
- Heads several- or many-fld . . . **26**
- 26. Fr. crowned with pappus . . . **27**
- Fr. without pappus or with only a short border **52**
- 27. Receptacle with scales . . . **28**

*) **Crepis paludosa** (easily recognised by its sagittate cauline ls) and some others have a dirty-white, brittle pappus.

- Receptacle without scales (in *Filago* there are, between the outer florets, scales resembling invol.-bracts) **39**
- 28. Inner invol.-bracts scarious, coloured (rayed) . **29**
- Inner invol.-bracts not rayed . . . **30**
- 29. Rayed invol.-bracts white or yellowish white. Pls prickly. Ls sinuate or pinnatifid . . . **Carlina. 328.**
- Rayed invol.-bracts rose-coloured. Pls not prickly. Ls entire, tomentose . . . **Xeranthemum. 334.**
- 30. Invol.-bracts in 2 rows. Ls opposite . . . **Bidens. 305.**
- Invol.-bracts imbricate. Ls alternate . . . **31**
- 31. Invol.-bracts (the inner ones sometimes excepted) attenuated to a hooked point (heads consequently clinging to anything they come in contact with). Ls denticulate, the lower ones very large, 3—4 dm broad **Lappa. 327.**
- Invol.-bracts not attenuated, terminated by a straight spine or a scarious appendage . . . **32**
- 32. Filaments of the stas united . . . **Silybum. 324.**
- Filaments of the stas free . . . **33**
- 33. Pappus plumose . . . **34**
- Pappus of simple hairs . . . **35**
- 34. Invol.-bracts and ls without prickles (Alpine pls with rose or violet fls) . . . **Saussurea. 329.**
- Invol.-bracts terminated by a spine of some length. Ls spiny or at any rate ciliate-spiny . . . **Cirsium. 323.**
- 35. Pappus-hairs united at the base and falling off together at last. Ls decurrent . . . **Carduus. 325.**
- Pappus-hairs falling off separately . . . **36**
- 36. Outer invol.-bracts leaf-like . . . **Kentrophyllum. 331.**
- Outer invol.-bracts not leaf-like . . . **37**
- 37. Pappus-hairs arranged in several rows, the innermost series longer than the others . . . **Serratula. 330.**
- Pappus-hairs arranged in several rows, the innermost series shorter than the last but one . . . **38**
- 38. Fr. with lateral hilum . . . **Centaurea. 332.**
- Fr. with basal hilum . . . **Crupina. 333.**
- 39 (27). Invol.-bracts arranged in a single row, equal in length, or accompanied at the base by some shorter bracts forming an outer involucre . . . **40**
- Invol.-bracts imbricate, the outer ones gradually diminishing in length . . . **43**
- 40. Stem leafless (scaly) . . . **41**
- Stem leafy . . . **42**
- 41. Stem with 1 head . . . **Homogyne. 288.**
- Stem with many heads . . . **Petasites. 290.**
- 42. Fls purple . . . **Adenostyles. 287.**
- Fls yellow . . . **Senecio. 320.**
- 43 (39). Ls opp. . . **Eupatorium. 286.**
- Ls altern. . . **44**

44. Prickly, thistle-like pls **Onopordon.** 326.
— Fls without prickles **45**
45. Fls all hermaphrodite **46**
— Outer fls female **47**
46. Fls yellow **Linosyris.** 291.
— Fls never yellow **Antennaria.** 310.
47. Some, at least, of the invol. bracts scarious. (Tomen-
tose or wooly-tomentose pls with indistinct fls) . . . **48**
— Invol. bracts herbaceous **51**
48. Receptacle with bract-like scales between the fem. fls
Filago. 307.
— Recept. without scales **49**
49. Heads all polygamous (on one stem all female, on the
other all hermaphrodite) **Antennaria.** 310.
— Heads with mixed fls (ray fls fem., disk fls hermapthro-
dite) **50**
50. Pappus hairs of the disk fls thickened (like a club)
towards the top **Leontopodium.** 309.
— Pappus hairs of all the fls filiform or only slightly
thickened towards the top **Gnaphalium.** 308.
51 (47). Fls yellow **Conyza.** 300.
— Fls never yellow **Erigeron.** 296.
52 (26). Receptacle having scales **Centaurea.** 332.
— Receptacle, without scales, glabr. or hairy **53**
53. Heads isolated, terminal with divergent, reflexed bracts.
Fr. beaked **Carpesium.** 306.
— Heads agglomerated or crowded **54**
54. Invol. bracts in 2 rows **Micropus.** 298.
— Invol. bracts imbricate (comp. also Matricaria discoidea)
55
55. Heads small or very small, gen. in spikes or racemes
arranged in a panicle **Artemisia.** 311.
— Heads of moderate size, in a flat corymb. Fls yellow
Tanacetum. 312.
56 (1). Receptacle having scales **57**
— Receptacle without scales **63**
57. Invol. bracts in 1—2 rows (Ray fls barren, yellow) **58**
— Invol. bracts in several rows (imbricate) **59**
58. Pappus short, crown-like. Ls altern. **Rudbeckia.** 303.
— Pappus consisting of 2—5 awns armed with small re-
flexed spines. Ls opp. **Bidens.** 305.
59. Ray fls barren **60**
— Ray fls female **61**
60. Ray fls yellow. Heads very large. Ls undiv.
Helianthus. 304.
— Ray fls white. Heads rather small. Ls 2—3 pinnatipar-
tite **Anthemis.** 314.

61. Anthers with 2 filiform appendages at the base. Ray fls yellow. Ls undivided . . . **Bupthalmum.** 302.
 — Anthers without appendages. Ray fls gen. white. Ls gen. 1—2 pinnatisect . . . **62**
62. Ligule of ray fls broad, rounded. Heads small, in a dense corymb . . . **Achillea.** 313.
 — Ligule of ray fls long. Heads larger, in a loose corymb **Anthemis.** 314.
- 63 (56). Pappus C, or only a prominent rim . . . **64**
 — Pappus hair-like . . . **67**
64. Disk fls hermaphrodite, barren; ray fls fertile; fls all yellow . . . **Calendula.** 321.
 — Ray and disk fls fertile, ray fls white . . . **65**
65. Invol. bracts in 2 rows. Stem leafless, only bearing 1 head . . . **Bellis.** 294.
 — Invol. bracts imbricate. Stem leafy . . . **66**
66. Fr. with 3—5 ribs on the inner face. Ls 2—3-pinnatipartite . . . **Matricaria.** 315.
 — Fr. equally ribbed all round . . . **Leucanthemum.** 316.
- 67 (63). Invol. bracts in 1 or 2 rows, equal in length or the outer ones forming an outer invol. . . **68**
 — Invol. bracts in several rows, imbricate. (Stem leafy) **74**
68. Pappus of the ray fr. simple, that of the disk double **Stenactis.** 295.
 — Pappus all alike, of the ray fr. sometimes 0 . . . **69**
69. Ray fls white . . . **Bellidiastrum.** 293.
 — Ray fls yellow . . . **70**
70. Fem. fls in several rows. Stem bearing only 1 head, scaly . . . **Tussilago.** 289.
 — Fem. fls in 1 row. Stem leafy, with 1—several heads **71**
71. Caul. ls opposite . . . **Arnica.** 319.
 — Caul. ls alternate . . . **72**
72. Invol. cylindric or conic . . . **Senecio.** 320.
 — Invol. hemispheric, or fairly flat. (Ls undiv.) . . . **73**
73. Ray fr. without pappus . . . **Doronicum.** 317.
 — All the fr. with pappus . . . **Aronicum.** 318.
- 74 (67). Fls of ray and disk of the same colour (yellow) **75**
 — Ray fls of a different colour . . . **77**
75. Anthers without appendages. Ray fls 5—8 **Solidago.** 297.
 — Anthers with appendages. Ray fls gen. numerous **76**
76. Pappus double, that of the circumference short, like a crown . . . **Pulicaria.** 301.
 — Pappus simple, a single row of hairs . . . **Inula.** 299.
- 77 (74). Ray fls very narrow, in several rows **Erigeron.** 296.
 — Ray fls broader, in a single row . . . **Aster.** 292.

Cl. 20. **Gynandria.**

1. Stas 6. Perianth gamopetalous, tubular, the limb cut obliquely into a ligule. Ls deeply cordate. Fls in the l.-axils **Aristolochia.** 499.
- Stas 1—2. Perianth with 6 divisions; 1 division of the inner circle (the lip) gen. twisted down by the torsion of the ovary, often of peculiar form. *Orchidaceæ* **2**
2. Pls with no green ls **3**
- Pls with green ls **6**
3. Lip prolonged to a spur **4**
- Lip not spurred **5**
4. Spur inflated, short, pointed upwards. Lip placed above **Epipogon.** 553.
- Spur subulate, pointed downwards. Lip placed below **Limodorum.** 554.
5. Lip 2-lobed at the extremity **Neottia.** 558.
- Lip undiv. at the extremity **Corallorhiza.** 561.
- 6 (2). Lip with a (sometimes short) spur **Orchis.** 541.
- Lip not spurred **7**
7. Pls having at their base 2 (rarely 1 or more than 2) entire, globular or oval, or compressed-palmatipartite, or cylindric-napiform tubers **8**
- Pls without subterranean tubers, but the stem bearing at its base a green, lateral tubercle. (Fls small, greenish) **12**
- Pls without tubers. Root formed of branched or fascicled fibres (not noticeably thickened) **13**
8. Lip with a 2-jointed knee, the foremost joint broken back. (Only in Tessin) **Serapias.** 551.
- Lip not jointed **9**
9. Stem and spike pubescent. Spike unilateral, twisted spirally. (Fls white) **Spiranthes.** 560.
- Stem and spike glabrous **10**
10. Divisions of the perianth all divergent. Fl. of a peculiar, insect-like form, lip velvety brown **Ophrys.** 548.
- Divisions of the perianth all (except the lip) connivent **11**
11. Lip stretched out, deeply 3-fid **Herminium.** 551.
- Lip drooping, 4-lobed **Aceras.** 550.
- Lip drooping, undiv., only with a tooth on each side **Chamæorchis.** 549.
- 12 (7). Lip obtuse, as long as the other divisions of the perianth **Sturmia.** 562.
- Lip acute, shorter than the outer divisions of the perianth **Melaxis.** 563.
- 13 (7). Stem with 2 opp. ls. Rad. ls 0. Fls greenish **Listera.** 557.

- Stem with more than 2 ls, or in any case the ls not opposite 14
- 14. Stem 1—2 fld. Lip inflated, sabot-shaped **Cypripedium.** 564.
- Fls in a spike or a many-fld raceme 15
- 15. Lip not jointed. Ls net-veined **Goodyera.** 559.
- Lip with 2 joints 16
- 16. Ovary twisted, sessile **Cephalanthera.** 555.
- Ovary pedicelled, pedicel twisted **Epipactis.** 556.

Cl. 21. Monœcia.

- 1. Ligneous pls (trees or shrubs) 2
- Water pls (submerged or floating) 17
- Herbaceous pls, growing on land or in swamps 24
- Grass-like pls **Carex.** 609.
- 2. Resinous trees, gen. with acicular, persistent ls 3
- Trees, the ls more or less broad, gen. falling in the autumn 6
- 3. Ls small, at any rate partly scale-like 4
- Ls narrow, linear (acicular) 5
- 4. Fr.-scales united at last and forming a false berry **Juniperus.** 669.
- Fr.-scales leathery-scarious or ligneous, forming a cone 4a
- 4a. Scales of the cone imbricate (overlapping one another).
Twigs flattened **Thuia.** 671.
- Scales of the cone shield-shaped. Twigs 4-cornered **Cupressus.** 670.
- 5. Scales of the cone thickened at the top, with a shield **Pinus.** 672.
- Scales of the cone thinner at the top **Abies.** 673.
- 6 (2). Ls pinnate. *Walnut* **Juglans.** 513.
- Ls simple, lobed, or pinnatifid 7
- 7. Male and fem. fls, or at any rate the males, in catkins 8
- Fls not in catkins 15
- 8. Male and fem. fls in catkins 9
- Fem. fls not in catkins 12
- 9. Fem. catkins in racemes of 3—5 (on a common peduncle).
Alder **Alnus.** 521.
- Fem. catkins solitary 10
- 10. Anthers glabr. at the top. Fem. catkins dense. *Birch* **Betula.** 520.
- Anthers with tufts of hair at the top. Fem. catkins lax 11

11. Fr. with a foliaceous, 3-lobed envelope. *Hornbeam*
Carpinus. 518.
 — Fr. enclosed in an urceolate, inflated envelope
Ostrya. 519.
- 12 (8). Male catkins almost globular, suspended. *Beech*
Fagus. 514.
 — Male catkins cylindric **13**
13. Male catkins erect. Fr. 2—3 in an envelope. *Chestnut*
Castanea. 515.
 — Male catkins drooping. Fr. isolated in their envelope
14
14. Male catkins dense. Fr.-envelope herbaceous-fleshy, gen.
 enveloping the fr. or entirely enclosing it. *Hazel*
Corylus. 517.
 — Male catkins interrupted. Fr.-envelope leathery-ligneous,
 short, cup-shaped, only surrounding the base of the fr.
Oak **Quercus.** 516.
- 15 (7). Ls opp., entire, persistent. *Box* **Buxus.** 502.
 — Ls altern., lobed or toothed, falling in autumn **16**
16. Fls in short spikes; the fem. fls forming a false berry
 like that of the wild mulberry, in consequence of the
 perianth becoming fleshy. *Mulberry* **Morus.** 510.
 — Fls enclosed in a fleshy, pear-shaped, hollow receptacle.
Fig **Ficus.** 511.
- 17 (1). Pls composed of small ls (fronds) at most 10 mm
 long, floating freely on the water **Lemna.** 535.
 — Pls with stem and ls **18**
18. Ls with dichotomous or pinnate divisions **19**
 — Ls undivided **20**
19. Seps 10—12. Cor. 0. Stas 12—20. Ls several times
 dichotomous **Ceratophyllum.** 192.
 — Cal. 4-partite. Pets 4. Stas 8. Ls pectinate-pinnatifid or
 pinnatifid **Myriophyllum.** 189.
20. Stas numerous. Ls sagittate **Sagittaria.** 528.
 — Stas 1—3 **21**
21. Ls with spiny teeth **Najas.** 534.
 — Ls entire **22**
22. Fls in globular heads **Sparganium.** 537.
 — Fls not in heads **23**
23. Ls linear or long-obovate **Callitriche.** 191.
 — Ls almost capillary **Zannichellia.** 533.
- 24 (1). Ls pinnate. Fls in heads. Stas 20—30. Stig. brush-like
Sanguisorba. 176.
 — Ls simple, undiv. or lobed **25**
25. One pedicelled ovary with 3 styles (fem. fls) and 10—20
 stas (male fls) in a common calyx-like envelope. Pls
 with milky juice and fls in a cyme or umbel
Euphorbia. 503.

- Ovary not pedicelled (comp. *Typha*) **26**
- 26. Fls united on a fleshy spadix surrounded by a sheath.
Rad. ls cordate, hastate or sagittate **27**
- Sheath 0, or (in *Typha*) very deciduous **28**
- 27. Spathe (or sheath) in the form of a horn. Spadix bearing the fem. fls at the base and above these the male fls, prolonged above in the form of a club **Arum. 538.**
- Spathe flat, white inside. Spadix with fls up to the top; the upper fls male, the others hermaphrodite **Calla. 539.**
- 28. Fls, at least the males, in globular heads, or cylindric spikes **29**
- Fls neither in heads nor spikes **31**
- 29. Ls broad, lobed. Pls growing on dry ground
Xanthium. 359.
- Ls linear, entire. Pls growing on marshy places **30**
- 30. Fls in cylindric spikes **Typha. 536.**
- Fls in globular heads **Sparganium. 537.**
- 31 (28). Stem climbing, with spiral tendrils. Ls cordate, 5-lobed **Bryonia. 197.**
- Stem not climbing, without tendrils **32**
- 32. Fl.-envelope composed of cal. and cor. Ls all radical **33**
- Fl.-envelope simple, a perianth, or 0. Ls partly cauline **34**
- 33. Stas numerous. Ls sagittate **Sagittaria. 528.**
- Stas 4. Ls linear-subulate **Littorella. 483.**
- 34. Ls opp. with stinging hairs, secreting a caustic liquid
Urtica. 505.
- Ls (except perhaps the first) altern., without stinging hairs **35**
- 35. Fem. fls without perianth, but with 2 bracts which are enlarged at maturity and enclose the fr. **Atriplex. 489.**
- Male and fem. fls with a perianth (ls oval or oval-rhomboidal) **Amaranthus. 484.**

Cl. 22. Dioecia.

- 1. Ligneous pls (trees and shrubs) **2**
- Herbaceous pls (and climbers) **15**
- Grass-like pls **Carex. 609.**
- 2. Small dichotomous shrubs, with opp. ls, tree-parasites
Viscum. 268.
- Pls not parasitic, growing on the ground **3**
- 3. Small leafless shrubs, with articulate branches
Ephedra. 667.
- Leafy trees or shrubs **4**
- 4. Resinous trees or shrubs (the ls resembling those of firs) **5**

- Trees or shrubs with larger ls (gen. decid. in autumn) **6**
- 5. False berry globular, closed, blackish blue. Ls in whorls of 3 Juniperus. 669.
- False berry saucer-shaped, open above, red. Ls arranged in 2 rows along the branches Taxus. 668.
- 6. Ls pinnate. Stas 2. Fr. a samara Fraxinus. 380.
- Ls simple, undiv. or lobed **7**
- 7. Fls in catkins **8**
- Fls not in catkins **9**
- 8. Perianth cup-shaped. Stas 8—30. *Poplar* Populus. 523.
- Perianth reduced to 1 or 2 glands. Stas 1—10 (gen. 2). *Willow* Salix. 522.
- 9. Ls palmatilobed **10**
- Ls undivided **11**
- 10. Stas gen. 8. Ls opposite Acer. 120.
- Stas 5. Ls altern. (or in clusters) Ribes. 209.
- 11. Stas 3. Seps and pets 3 Empetrum. 501.
- Stas 4—12 **12**
- 12. Fls supported by ls (or more correctly by branches enlarged like ls) Ruscus. 577.
- Fls not supported by ls **13**
- 13. Pets small, greenish. Style 2—4-fid. Stas 4 Rhamnus. 130.
- A simple perianth. Style undiv. **14**
- 14. Perianth of fem. fls 2-fid. Stas 4. Spiny shrubs Hippophaë. 498.
- Perianth 4-partite. Stas 9—12 Laurus. 496.
- 15 (1). Pls consisting of small ls (fronds), floating freely on the water Lemna. 535.
- Pls with stem and ls **16**
- 16. Water pls (floating or submerged) **17**
- Land pls **19**
- 17. Ls reniform. Stas 9 Hydrocharis. 525.
- Ls linear or grass-like. Stas 1—3 **18**
- 18. Ls opp., or in clusters of 3, spiny-toothed Naias. 534.
- Ls all radical, finely denticulate only at the extremity Vallisneria. 524.
- 19 (16). Stem climbing **20**
- Stem not climbing **22**
- 20. Ls opp. Stigs 2 Humulus. 507.
- Ls altern. Style 3-fid **21**
- 21. Pls with spirally twisted tendrils. Ls lobed. Fls greenish-yellow or yellowish-white Bryonia. 197.
- Tendrils 0. Ls undiv. Tamus. 578.
- 22 (19). Cor. gamopet., 5-fid. Ls opp. Valeriana. 279.
- Cor. with several pets, or perianth with 3—5 divisions **23**
- 23. Fl.-envelope composed of cal. and cor. **24**

- Fl.-envelope simple, (a perianth) 27
- 24. Ls compound **Spiræa.** 164.
- Ls undiv. 25
- 25. Several carpels separated almost to the base, and dehiscing on the inner side by a longitudinal slit. Ls altern. **Sedum.** 206.
- Fr. a caps., opening by 6 or 10 teeth. Ls opp. 26
- 26. Styles 5. Caps. with 10 teeth **Melandrium.** 97.
- Styles 3. Caps. with 6 teeth **Silene.** 95.
- 27 (23). Ls altern. or in clusters 28
- Ls, at any rate the lower ones, opp. 29
- 28. Styles 3, with a multifid stig. Ls broad **Rumex.** 491.
- Style 1, with a very short stig. Ls linear **Asparagus.** 571.
- 29. Ls digitate, with 5—9 leaflets. Stas 5. Stigs 2. *Hemp*
Cannabis. 506*.
- Ls not divided 30
- 30. Fls in panicles placed in the leaf-axils, the males with 4 stas, the females with 1 brush-like stig. **Urtica.** 505.
- Male fls in interrupted spikes, with 9—12 stas, fem. fls 1—3 together in the leaf-axils; with 2 stigs
Mercurialis. 504.

Cl. 23. Polygamia.

The pls placed by Linnæus in this class have been distributed among the other classes according to the construction of their hermaphrodite fls.

Cl. 24. Cryptogamia.

In this work only the more highly organised Cryptogams are treated of, viz. the **vascular Cryptogams.**

- 1. Pls growing at the bottom of stagnant water. (Fr. at the base of the ls) 2
- Land pls, sometimes also standing in water, but never submerged or floating 4
- 2. Ls with long petioles, formed of 4 obcordate-cuneiform leaflets **Marsilea.** 675.
- Ls without petioles, subulate 3
- 3. Stem reduced to the form of a bulb. Ls in clusters
Isoëtes. 676.
- Stem filiform, creeping. Ls isolated **Pilularia.** 674.
- 4 (1). Ls 0 (or, more correctly, transformed to a sheath crowned with teeth). Stem articulate, simple or with whorled branches. Fructification terminal, in the form of a cone-like spike
Equisetum. 679.
- Ls present 5

5. Ls small (5—10 *mm*), numerous, undiv., covering the, gen. dichotomous, stem entirely. Sporangia in the axils of ordinary, or more often, reduced ls (bracts), arranged in a spike **6**
- Ls (fronds) larger (more than 10 *mm*). *Filices* **7**
6. Sporangia of 2 forms, the one with large spores, the other with numerous small ones. (Delicate moss-like pls) **Selaginella.** 677.
- Sporangia all of one kind, with numerous small spores **Lycopodium.** 678.
7. Sporangia arranged in a spike or panicle **8**
- Sporangia grouped in brown clusters (sori) on the under side of the frond **10**
8. Fronds rolled up spirally when young, the upper part of one frond fertile, forming a panicle **Osmunda.** 682.
- Fronds not rolled up when young, divided more or less deeply into a fertile and a barren part **9**
9. Fructification in a distichous spike. Barren part of the frond undiv. **Ophioglossum.** 680.
- Fructification in the form of a panicle (rarely reduced to a spike). Barren part of the frond pinnatisect or 2-pinnatisect (very rarely entire) **Botrychium.** 681.
- 10 (7). Fertile and barren fronds differing in form **11**
- Fertile and barren fronds of the same form **13**
11. Groups of sporangia forming 2 lines, parallel to the middle nerve **Blechnum.** 688.
- Groups of sporangia, at any rate finally, forming a continuous marginal line **12**
12. Fronds 3-pinnatisect **Allosurus.** 685.
- Fronds simply pinnatisect; segments of the barren fronds finely toothed **Pteris.** 687.
- Fronds pinnatisect; segments of the barren fronds pinnatifid **Onoclea.** 696.
- 13 (10). Fronds thickly covered on the under side with chaffy scales (tegument 0) **14**
- Fronds glabr. underneath, or with scattered chaffy scales **15**
14. Fronds simply pinnatisect **Ceterach.** 692.
- Fronds 2-pinnatisect **Gymnogramme.** 684.
15. Groups of sporangia covered entirely or partly by the reflexed edge of the frond **16**
- Groups of sporangia covered, at any rate when young, by a membranous tegument (indusium) **17**
- Groups of sporangia naked, without a tegument, and not covered by the edges of the frond **22**
16. Groups of sporangia in a continuous line. Pls of 70 to 150 *cm* **Pteris.** 687.

- Groups of sporangia in an interrupted line. Pls of 20—30 *cm* **Adiantum.** 686.
- 17. Groups of sporangia lateral, linear or elongated, rarely horse-shoe shaped. Tegument with a broad base, united laterally to the nerve **18**
- Groups of sporangia dorsal (sup. or inf.), gen. rounded, inserted on the back of the nerve **20**
- 18. Groups of sporangia in pairs, their teguments turned with their free edges one towards the other. Fronds undiv. **Scolopendrium.** 689.
- Groups of sporangia isolated. Fronds more or less divided **19**
- 19. Groups of sporangia linear or longish. Chaffy scales arranged like lattice-work **Asplenium.** 690.
- Groups of sporangia oblong or horse-shoe shaped. Scales not latticed **Athyrium.** 691.
- 20 (17). Tegument sup. (lying on the group of sporangia), or peltate, *i. e.* attached in the centre, or reniform and attached in the indenture **Aspidium.** 694.
- Teg. inf. (springing from the base of the group of sporangia) **21**
- 21. Teg. unilateral, only spread over the groups of sporangia from one side, and finally folding back **Cystopteris.** 695.
- Teg. completely surrounding the groups of sporangia, cut like a fringe **Woodsia.** 697
- 22 (15). Petiole jointed at the base. Fronds simply pinnatisect **Polypodium.** 683.
- Petiole not jointed. Fronds 2—3-pinnatisect **Phegopteris.** 693.

III. Tables for determining the species.

1. Ranunculaceæ.

1. Clématis. Clematis. XIII, 14.

1. Stem solid, woody, climbing. Seps tomentose on both sides. — Hedges and thickets; distrib.; a var. *integrifolia* near Geneva. 7 **Vitalba L. 1.**
- Stem hollow, herbaceous, erect. Seps glabr., only pubescent on the outer edge. — Thickets; T. W. 5, 6. **recta L. 2.**

2. Atragéne. Atragene. XIII, 14.

1. A climbing shrub. Fls violet, rarely white. — Alp. and subalp.; Graub., Charmey (Freibg.). Boltigen (Bern). Salève. 5. **alpina L. 3.**

3. Thalictrum. Thalictrum. XIII, 18.

1. Achenes pedicelled, 3-cornered. Fls lilac. — Wood-margins and damp thickety places; distrib. 5, 6. **aquilegifolium L. 4**
- Achenes sessile or shortly pedicelled, ribs 7—12. Fls greenish or yellowish **2**
2. Achenes pedicelled, bent. Fls. gen. in a simple raceme. Stem 3—15 cm, leafless. — Damp alpine places; Graub. (south-east) 7. **alpinum L. 5.**
- Achenes sessile, straight. Fls in a panicle. Stem 30—100 cm, leafy. **3**
3. Leaf-segments rounded or rounded-obovate, about as broad as long **4**
- L.-segments (at any rate in the middle and upper ls) several times as long as broad **6**
4. Pls. thickly covered with glandular hairs which are thickened at the base. L.-segments very small. Fr. large. — b. Pl. glabr. or almost so; segments rather larger. — Rocky places; G. T. W. B. O. Uri. 6. **foetidum L. 6.**
- Pls glabrous, rarely with very shortly stipitate glands. Type of *Th. minus**) **5**
5. Ls crowded near the middle of the stem; segments small, rather firm, with prominent nerves underneath. *Th. calcareum* Jord., *Grenieri* Lor., *alpestre* Gaud. (dwarf form). — Hills, rocky places, especially in the mount. and subalp. Gen. confused with the two following and, in consequence, the localities are still doubtful! *Hospenthal*, *Col de Torrent*,

*) Here also: *Th. Laggeri* Jord., *ambiguum* Schl., *pubescens* auct. an Schl.? *elatum* and *nutans* Gaud. *Jacquinianum* Koch, *flexuosum* Rehb., *oreites* Jord. etc.

Alp de Mortais, Creux du Van, Hasenmatt, Lägern, &c. 6.
saxatile Dec. 7.

- Ls more equally distributed on the stem; segment of a medium size, with less prominent nerves underneath. Fr. small, with short stigs. Th. *præcox* Jord.? Comp. the last. 5, 6 **minus L. 8.**
- Ls as in the last, but segments larger, thinner, slightly bluish green, easily turning black in drying; panicle leafy, often almost in a corymb; pedicels thinner, longer; stig. of young fr. narrower and longer.—T. W. 6.
majus Jacq. 9.
- 6 (3). Fls in a rather loose panicle. Stas drooping; anthers shortly apiculate. Rt.-stock creeping. Th. simplex and angustifolium auct. helv.—b) *galioides* Nestl. L.-segments linear or almost filiform.—c) *alpicolum* Jord.! Segments broader, fls more numerous and closer together.—Hills, pasturages; scattered (wanting in U.); c. Bagnethal. 6, 7
Bauhini Crantz. 10.
- Fls clustered at the top of the twigs. Stas erect; anthers not apiculate **7**
- 7. Rt.-stock not creeping. L.-segments oblong-cuneiform in the upper ls linear, gen. undiv.; in the lower finely pubescent underneath.—South Tyrol, Piémont (Tess.?) 6, 7 *** angustifolium Jacq. 11.**
- Rt.-stock creeping. Segments obovate-cuneiform, the upper elongated, often 3-fid **8**
- 8. Ls finely pubescent underneath—Water-side; T. (Maggadino, Lugano). 6. **exaltatum Gaud. 12.**
- Ls glabr. underneath.—Damp meadows, water-side; fairly distrib. (wanting in G.) 7 **flavum L. 13.**

4. Anemone. Anemone. XIII, 17, 25.

- 1. Invol. very close to the fl. and resembling a cal. of 3 seps. Rad. ls cordate, 3-lobed; lobes entire. *Hepatica triloba* Chaix.—Thickets, stony slopes; fairly distrib. 3
Hepatica L. 14.
- Invol. distant from the fl., gen. more or less div. and resembling caul. ls **2**
- 2. Fls 2—8 in an umbel, white, often streaked with rose outside. Carps glabr.—Alp. and Jura. 6 **Narcissiflora L. 15.**
- Fls 1—3. Carps villous or pubescent **3**
- 3. Seps yellow, pubescent underneath. Invol. as in the following but the petiole much less than $\frac{1}{2}$ the length of the leaflet.—Meadows, water-side thickets; distrib. 4
ranunculoides L. 16.
- Seps never yellow (comp. 18) **4**

4. Seps glabr. on both sides, white, often streaked with rose or violet. Invol.-ls 3-sect; segments 2—3-fid, unequally inciso-dentate; petioles about $\frac{1}{2}$ the length of the invol. l.—Woods, thickets; everywhere. 4
nemorosa L. 17.
- Seps villous or pubescent on the back **5**
5. Carps as in Clematis terminated by a long, plumose queue (prolongation of the style) **6**
- Carps with short, glabr. styles **10**
6. Invol.-ls free at the base, with short, broad petioles, resembling the rad. ls. Fls white, sometimes tinted on the outside with violet, or (b. *sulfurea* L.) sulphur-yellow.—Alp, subalp. and Jura; b. only on granite soil. 6
alpina L. 18.
- Invol.-ls sessile, united at the base in a sheath, palmatispartite, differing from the rad. ls. Fls light or dark violet **7**
7. Rad. ls persist. during winter, simply pinnatisect; segments obovate-cuneiform, 2—3-fid, with broad lobes. Hairs shining, brownish-yellow.—Alp. and subalp. 5—7
vernalis L. 19.
- Rad. ls dying in the autumn, 2—3-pinnatisect, with linear or linear-lanceolate lobes **8**
8. Ls very villous, hardly 2-pinnatisect, with linear-lanceolate lobes.—Alp. of Wall. (upper Nicolaithal). 7
Halléri All. 20.
- Ls glabr. throughout almost their entire development, 3-pinnatisect, with linear lobes (Type of *A. Pulsatilla*) **9**
9. Fls. more or less erect, gen. light violet.—Sunny hills, here and there; G. W. V. J. Z. S. 3, 4 **Pulsatilla L. 21.**
- Fls. drooping, dark violet, rarely rose, light blue or whitish (Montorge!).—As the last; G. W. T. 3, 4, rather later than the last **montana Hoppe. 22.**
- 10 (5). Invol.-ls sessile, entire or slightly incised, differing from the rad. ls. Anthers blue. *A. hortensis* auct. p.—Southern Europe; formerly near Chillon! 4
***stellata Lam. 23.**
- Invol.-ls petioled, almost like the rad. ls. Anthers yellow **11**
11. Ls 2-ternatisect, with 2—5-fid segments. Stem 10—15 cm.—High Alp. W. V. B. O. 7 **Baldensis L. 24.**
- Ls palmate 5-partite, with 2—3-fid segments. Stem 20 to 40 cm.—Slopes; northern side of Hauenstein above Läufelfingen; and on the northern frontier near Grenzach (and Mundelfingen). 5 **sylvestris L. 25.**

5. **Adonis.** **Adonis.** XIII, 27.

1. Pets 15—20, yellow.—Perenn. pls.—Sunny slopes. W. (Folateires, Charat, Saxon etc.) 4 **vernalis** L. 26.
- Pets 5—8, red, often touched with black at the base, rarely straw-coloured. Ann. pls. 2
2. Seps spreading; pets concave, connivent.—Corn-fields; Wall. rare (subspontaneous?). 5, 6 **autumnalis** L. 27.
- Seps applied to the spreading pets 3
3. Seps glabr., flat. Fr.-spike dense. A. *ambigua* Gaud.—b. *flava* Vill.—Corn-fields; G. W. J. Z. S. and sometimes adventitious. 5, 6 **æstivalis** L. 28.
- Seps hairy, concave. Fr.-spike looser. Fls with longer peduncles and darker than in the last.—b. *citrina* Dec.—As the last; Wall., Bâle, Schaffh. 5, 6 **flammea** Jacq. 29.

6. **Myosûrus.** **Mouse-tail.** V, 139.

1. Ls all radical, almost linear. Stem 5—8 cm, with a single fl.—Rather damp fields; near Payerne (Etrabloz), Bâle and Boswyl (Aarg.). 5. **minimus** L. 30.

7. **Callianthemum.** **Callianthemum.** XIII, 27.

1. Ls 2-pinnatisect; segments 3—multi-fid, with linear lobes. Pets white, with a yellow claw.—High Alp.; G. W. Schöngiebel between the Brienzer Rothhorn and Lungern. Calveis (Appenzell). 6, 7 **rutæfolium** C. A. Mey. 31.

8. **Ranúnculus.** **Ranunculus.** XIII, 27.

1. Fls white or rose-coloured 2
- Fls yellow 13
2. Peduncles recurved after flowering. Water pls (lower leaf or all multifid, with capillary segments) 3
- Peduncles straight after flowering. Pls growing on dry land or by the water-side, gen. in the Alp. or mount. 6
3. Lobes of submerged ls very long, almost parallel. Stas shorter than the head of carpels.—Varied rarely with floating ls and b. *Bachii* Wirtg. Pets smaller, gen. 5.—Running streams; J. B. Z. A.; b. near Schaffh. 6 **fluitans** Lam. 32.
- Lobes of submerged ls spreading. Stas gen. longer than the head of carpels 4
4. Lobes of the submerged ls stiff, spreading in a disk, not cohering when taken out of the water. Peduncles 4—5 times as long as the ls.—Standing water; fairly distrib. 5 **divaricatus** Schrank. 33.
- Lobes of the submerged ls standing out on all sides, limp. Peduncles as long or rather longer than the ls 5
5. Fls rather large. Pets broad, obovate. Stas 20 and more. Floating ls gen. developed, 3—5-lobed.—Standing or

- slowly flowing water; rarer than the following; W. V. J. G. . . . ? **aquatilis L. 34.**
- Fls rather small. Pets narrower, obovate-oblong, deciduous. Stas 7—18. Floating ls gen. 0; if developed deeply 3-partite, with cuneiform segments, sometimes petioluled and div. like a fan.—a. *R. paucistamineus Tausch.* Stas 10—15. Receptacle almost globular. The form with floating ls: *R. Petiveri Koch p.**)—b. *R. Drouettii F. Schultz.* Stas 5—10. Receptacle ovoid? Carps almost obtuse. Fls. smaller,—c. *R. confervoides Fr. 1845* (*lutulentus Perr. Song. 1859*). Fls small. Carps slightly compressed, with rather long, recurved beaks. Dwarf pls. W. (Zermatt, Bagnethal).—d. *R. Rionii Lagg.* (*sedunensis Rion.*). Stas shorter (in the 3 last longer) than the head of carpels. Receptacle conic. Carps 80—90 (in the last 20—35). W. (Siders, Sion, Saillon, later than the last).—As the last, but distrib. 5 **Trichophyllus Chaix. 35.**
- 6 (2). Ls undiv. and gen. entire **7**
- Ls divided **8**
7. Rad. ls linear-lanceolate or lanceolate. Seps glabr.—b. *plantagineus All.* Stem with several (up to 7) fls; ls broader.—High Alp. 6 **pyrenæus L. 36.**
- Rad. ls cordate-oval. Seps hairy.—High Alp. (wanting in U.). 6 **parnassifolius L. 37.**
8. Cal. rough with reddish brown hairs. Varied, especially on granite, with web-like hairs (v. *holosericeus*).—High Alp. 7 **glacialis L. 38.**
- Cal. glabr. or slightly hairy **9**
9. Carps inverted (the hilum at the top of the carp.). Comp. the genus *Callianthemum*.
- Carps not inverted (hilum at the base) **10**
10. Stem 30—90 cm bearing several (in dwarf forms few) fls. Caul. ls, at any rate the lower ones, palmatifid, with 3—7 divisions. Receptacle villous. Pls never entirely without hairs. Type of *R. aconitifolius* **11**
- Stem 5—10 cm, 1-fld. Caul. l. undiv. or, when there are two, the lower one 2—3-fld. Receptacle glabr. Pls entirely glabr. Type of *R. alpestris* **12**
11. Stem with spreading branches. Ls div. to the petiole; lobes simply acute, those of the upper caul. ls toothed.—Damp places and brook-margins, especially in the mount. and subalp. 5 **aconitifolius L. 39.**

*) The following still require final examination: **R. radians Rev.** (*trichophyllus Wallr.*?) which has the large broad pets of *R. aquatilis*, but the rather shorter peduncle and deeply div. floating ls of *R. trichophyllus*. V. (Lavigny!)—**R. Godroni Gren.** with the smaller fls appears to be an *heterophyllus* form of *paucistamineus*. See N. Beitr. III, 1.

- Stem with erect branches. Ls not so deeply div.; lobes narrowed to a point, those of the upper caul. ls entire. —As the last, but in dry places and not descending to the plains. 6 **platanifolius L. 40.**
- 12. Rad. ls 3—5-lobed; lobes inciso-crenate at the top, (sometimes 1 or 2 ls entire).—Alp., subalp. and Jura. 6, 7 **alpestris L. 41.**
- Rad. ls deeply 3-fid, or almost 3-sect; the middle segment 3-fid, the 2 lateral ones deeply 3-fid, the lobes being sometimes 2—3-fid, linear-lanceolate.—Alp.; reported; G. O. (?). 6 ***Traunfellneri Hoppe. 42.**
- 13 (1). Rt.-fibres thickened, fascicled **14**
- Rt.-fibres not thickened (in 58 the base of the stem bulb-shaped) **15**
- 14. Pets 5, obovate. Rad. ls 0, the lower caul. l. rounded—reniform, crenate.—Alp. and Jura; G. T. W. V. 6 **Thora L. 43.**
- Pets 6—12, linear-oblong. See genus *Ficaria*.
- 15. Ls all undiv. **16**
- Ls div. or only the rad. entire **19**
- 16. Carps with no rim, wrinkled. Ls linear-lanceolate. Base of the stem surrounded by a thick layer of fibres.—Hills; St. Leonard in Wall. 5 **gramineus L. 44.**
- Carps with a rim, smooth **17**
- 17. Stem erect, 70—100 cm. Fls. large (about 30 mm). Ls oblong-lanceolate, acuminate. Ditches, waterside; distrib. 6 **Lingua L. 45.**
- Stem ascending or prostrate, rarely quite erect. Fls. much smaller. Type of *R. Flammula* **18**
- 18. Stem ascending or prostrate and rooting at the nodes, with almost straight internodes. Carps with a short, straight or slightly curved beak.—Ditches, marshes; distrib. 6 **Flammula L. 46.**
- Stem slender, almost filiform, the whole length prostrate, rooting, with arched internodes. Carps with a more distinct, curved beak. Ls narrower. Fls smaller, often solitary, with narrow pets.—Damp sandy shores of lakes and rivers; not everywhere. 6. **reptans L. 47.**
- 19 (15). Carps 5—7, very large, rough with spines. Pets small, pale yellow.—Fields; distrib. 5, 6 **arvensis L. 48.**
- Carps numerous, smaller, smooth or very slightly wrinkled **20**
- 20. Fr.-head long, ovoid or cylindric. Carps with no rim, 70 to 100. Ann., rather fleshy pls. Pets very small, pale yellow.—Damp places, marshes; not common. 5 **sceleratus L. 49.**
- Fr.-head almost globular. Carps with a rim, 20—30 **21**
- 21. Peduncles not or hardly furrowed **22**

- Peduncles furrowed **26**
- 22. Carps pubescent. Rad. ls rounded-reniform, sometimes undiv. and crenate, sometimes palmatipartite with 3—5 divisions; caul. ls palmatipartite, gen. with linear and entire lobes. Pets gen. partly suppressed (*R. palustris* Heg.), rarely all developed, large (*R. auricomus* Heg., if the rad. ls are, at the same time, entire).—Orchards, hedges; distrib. but wanting in U. A. 4

auricomus L. 50.
- Carps glabr. Rad. ls more or less angular in outline, palmatipartite **23**
- 23. Receptacle hairy. Stem gen. solid, 1—3- (rarely 5-) fld. Type of *R. montanus* **24**
- Receptacle glabr. Stem hollow, with several or many fls (at any rate in the larger pls) **25**
- 24. Beak of the carp. slightly bent, about $\frac{1}{3}$ as long as the carp. or still less. Stem 5—15 cm.—b. *gracilis* Schleich. (*geraniifolius* Pourr.). Pls small, the l.-lobes more acute; beak very short.—c. *oreophilus* M. B. (*R. Villarsii* auct. p.) Pls taller with several fls; ls hairy, the lobes more acuminate.—Alp., subalp. and Jura. 5, 6 **montanus Wild. 51.**
- Beak of carp. hooked, $\frac{1}{2}$ as long as the carp. or more. Stem 25—50 cm. Rt.-stock horizontal, thick. *R. Villarsii* auct. p.—Southern Alp.; St. Bernard! Bex! 6

aduncus Gr. Godr. 52.
- 25. Beak of the carp. bent, much shorter than the carp. Hairs of stem and peduncles gen. applied.—b. *multifidus* Dec. (*R. Boræanus* Jord.), forma *angustisecta*, with a short rt.-stock.—c. *Frieseanus* Jord. Rt.-stock longer, with bunches of fibres at the neck; stem covered below with yellowish, gen. spreading hairs.—Fields; everywhere; b. G. W. V.; c. Aigle, Vevey! and probably in other places. 5 **Acris L. 53.**
- Beak of the carp. much hooked, almost $\frac{1}{2}$ as long as the carp. Hairs of stem and petioles spreading, yellowish.—Mountain forests; distrib. 6 **lanuginosus L. 54.**
- 26 (21). Rad. ls palmatipartite or palmatisect. (Seps loosely applied. Receptacle hairy.) **27**
- Rad. ls 3-sect or 2—3-sect, the middle lobe often petioluled **28**
- 27. Beak short, bent. Rad. ls deeply div., with linear-lanceolate segments.—Wood clearings; Chur; Brügg. 5, 6

polyanthemus L. 55.
- Beak longer, rolled up at the top. Rad. ls with 3—5 gen. broad, obovate cuneiform divisions. Var. with less numerous and darker yellow fls (v. *aureus* Schl.), and with the ls div. into narrow lobes (v. *angustisectus*).—Woods; distrib. 5, 6 **nemorosus Dec. 56.**

28. Seps loosely applied. *R. reptabundus* Jord. (v. *angustisectus*).—Vineyards, edges of ditches, roads; everywhere. 5, 6 *repens* L. 57.
 — Seps reflexed from the middle 29
29. Stem swollen like a bulb at the base. Carps smooth (with fine dots when magnified). *R. albo-nævus* and *sparsipilus* Jord., *brachiatus* Schl.—Grassy places, road-sides; everywhere. 5 *bulbosus* L. 58.
 — Stem not swollen at the base. Carps with small tubercles (which are sometimes wanting) on the disk. *R. Philo-notis* Ehrh.—Damp places; road-sides. W. V. Z. (Aarg.). 6
sardous Crantz. 59.

OBS. The following hybrid forms have been observed: *R. aconitifolius glacialis* (*aconitoides* Dec.), *aconitif.-pyrenæus* (*lacerus* Bell.), *alpestris-glaciali* (*gelidus* Hffms.).

9. *Ficaria*. Lesser Celandine. XIII, 25.

1. Ls rounded-cordate, the lower sinuate, the upper angular. Rt. composed of fibres thickened like a tuber. *Ranunculus Ficaria* L.—Hedges and ditches; everywhere. 4 *verna* Huds. 60.

10. *Caltha*. Marsh Marigold. XIII, 18.

1. Ls rounded-reniform, crenate or toothed. Fl. large, golden-yellow. *C. Guerangerii* Bor.—Brooks, ditches; everywhere. 4. *palustris* L. 61.

11. *Trollius*. Globe-flower. XIII, 21.

1. Ls palmatisect; segments rhomboidal, 3-fid, inciso-dentate. Seps numerous, yellow, converging in a globe.—Damp fields, especially in the mount. and subalp. 5—7
europæus L. 62.

12. *Eranthis*. Winter Aconite. XIII, 21.

1. One orbicular, multifid leaf; a similar invol. on which the solitary yellow fl. is placed.—Orchards; rare. (Bex, Treycoyagnes, Morat, Bienne, Soloth., Bâle, Zürich, etc.)
 2, 3 *hiemalis* Salisb. 63.

13. *Helléborus*. Hellebore. XIII, 23.

1. Stem leafless, bearing only 1 or 2 small undiv. bracts, gen. 1-fld. Seps white or streaked with rose.—Tess. (M. Genesio, M. Salvatore). 2, 3; in mild winters also 12—1; often cultivated under the name of Christmas rose
niger L. 64.
 — Stem leafy, with several or many fls. Seps greenish 2

2. Stem leafy below the fl.-branches (about the middle of the stem). Seps conniving like a bell, with red edges. Thickets; hedges; distrib. in western Switz. 3 *foetidus* L. 65.
- Stem with (div.) ls only on the fl.-branches. Seps spreading 3
3. Stigs erect. L.-segments almost uniformly toothed. *H. occidentalis* Reut.—As the last, but rather rarer. 3 *viridis* L. 66.
- Stigs spreading. L.-segments irreg. toothed.—As the last; Bregenz by Riedschlösschen; Chur. 3 **odorus* W. K. 67.*)

14. *Isopyrum*. *Isopyrum*. XIII, 23.

1. Ls 2-ternatisect. Fls white.—Thickets; Chancy near Geneva. 4 *thalictroides* L. 68.

15. *Nigella*. *Devil-in-the-bush*. XIII, 22.

1. Ls 2—3-pinnatisect, with linear lobes.—Fields; W. B. J. Z. S. 7, 8 *arvensis* L. 69.

16. *Aquilégia*. *Columbine*. XIII, 15.

1. Stem 3—10-fld. Last segments of the ls gen. broader than long. Fls large, blue-violet.—b. *atrata* Koch. Fls smaller, gen. brownish red or blackish violet; stas more prominent.—Wood-edges, thickets, fields; distrib., especially b. 6 *vulgaris* L. 70.
- Stem 1—3-fld. Last segments of the ls longer than broad. Fls very large (60—70 mm), blue-violet.—Alp.; not common. 7 *alpina* L. 71.

17. *Delphinium*. *Larkspur*. XIII, 12, 2.

1. Ls palmatipartite, with 3—5 broad, 3-fld, inciso-dentate divisions. Carps 3—4.—Alp. 7 *elatum* L. 72.
- Ls 3—multi-fld, with narrow lobes. Carp. 1 2
2. Carp. glabr. Racemes short, few-fld.—Corn-fields; fairly distrib. 6 *Consólida* L. 73.
- Carp. pubescent. Racemes many-fld. 3
3. Stem with divergent branches. Racemes loose. Carps narrowed insensibly to the style. Fls gen. blue.—Southern Europe. Ornamental pls. 6 † *Ajácis* L. 74.
- Stem simple or with erect branches. Fl.-racemes dense. Carps. suddenly narrowed to the style. Fls gen. violet.—An eastern ornamental pl. 6 † *orientale* Gay. 75.

18. *Aconitum*. *Aconite*. *Monkshood*. XIII, 12.

1. Fls blue, violet, or variegated with white 2
- Fls yellowish 5

*) *H. dumetorum* W. K. See N. Beitr. II, 1.

2. Young carps diverging (soon after flowering). The hood, supported on an arched filament, horizontal, with a very short spur 3
- Young carps parallel-connivent (casque distinctly higher than broad) 4
3. Upper part of the stem gen. simple, straight, glabr. or, like the peduncles, covered with small crisp hairs. Racemes dense (rarely loose or branched). L.-segments linear or linear-lanceolate. Casque not quite or about as high as broad, bent down over the lower seps.—Alp., subalp. and Jura; descending to the valleys. 6, 7
Napellus L. 76.
- Upper part of the stem branched, often flexible, covered, like the spreading peduncles, with jointed hairs. Racemes paniculate, loose. L.-segments lanceolate or oblong. Casque as in the last or (*v. hebegynum* Dec.) distinctly higher.—Alp. and subalp., rare in the Jura. 7
paniculatum Lam. 77.
4. Hoods obliquely supported on filaments which are arched at the top. Stas gen. hairy. *A. intermedium* Dec. *Napellus-paniculatum*?—Alp., rare, G. O.; also cultivated (barren!) 7
Stoerkianum Rchb. 78.
- Hoods vertical or slightly and obliquely inclined forwards, on filaments which are straight or only slightly curved towards the top. Stas gen. glabr. Casque high! Inflorescence gen. glabr., often leafy at the base. L.-segments broader than in *A. Napellus*; carps gen. 4--5. *A. rostratum* Gaud. *Cammarum* Jacq.—Alp. and subalp.; not common. 7 **variegatum L. 79.**
- 5 (1). Ls palmatifid; segments rhomboidal-cuneiform, 3-fid and inciso-dentate. Casque almost 3 times as high as broad.—Mountain woods; distrib. 7 **Lycóctonum L. 80.**
- Ls palmatipartite; divisions multifid with linear lobes. Casque about as high as broad.—Jura (Dôle and Mont d'Or). 8 **Anthora L. 81.**

19. *Actæa*. Baneberry. Herb Christopher. XIII, 8.

1. Ls 2—3-ternatisect. Fls in short racemes, white. Berries black.—Woods; distrib. 5 **spicata L. 82.**

20. *Pæónia*. Pæony. XIII, 26.

1. Ls 2-ternatisect. Underside of leaflets whitish-glaucous. Fls large, red. (*P. officinalis* of gardens has the underside of the leaflets paler green and rather shining).—M. Generoso in Tess. 6 **peregrina Mill. 83.**

2. Berberideæ.

21. Bérberis. Barberry. VI, 3.

1. Ls oblong-obovate, fringed with prickles at the margins. Stas approaching the pistil when touched.—Hedges, thickets; distrib. 5 *vulgaris* L. 84.

22. Epimédium. Epimedium. IV, 14.

1. Ls 2-ternate; leaflets petioluled, cordate-oval, dentate-spiny. Pets brown-red, paracorolla yellow.—Southern Tyrol, naturalised near Bévieux and Bâle for some time. 4
† *alpinum* L. 85.

3. Nymphæaceæ.

23. Nymphæa. White water Lily. XIII, 4.

1. Filaments of the inner stas narrower than or rarely as broad as the anthers. Rays of the stig. gen. yellow. Ovary more or less globular, covered almost up to the top with stas.—Standing water; distrib. 6 *alba* L. 86.
- Filaments of the inner stas broader than the anthers. Rays of the stig. red. Ovary ovoid, thinner below the stig. and without stas in that part. (See N. Beitr. II, 2).
—As the last; reported from Cantons St. Gall and Zürich. 6
* *cándida* Presl. 87.

24. Nuphar. Yellow water Lily. XIII, 4.

1. Stig. with an entire, or slightly sinuate edge; the rays vanishing before reaching the margin.—Standing water, distrib. (wanting in G.) 6 *lúteum* Sm. 88.
- Stig. toothed or stellate, the rays almost reaching the margin. Smaller pls in every way. Fls about as large as in *Caltha*. N. *intermedium* Rehstein. not Led. (See N. Beitr. I, 2).—As the last; J. B. Z. A. (Hüttensee; Gräppelerbergsee). 6 *púmulum* Sm. 89.

OBS. *N. intermedium* Led. (*Spennerianum* Gaud.) is, according to Caspary a hybrid between the two last.

4. Papaveraceæ.

25. Papáver. Poppy. XIII, 6.

1. Stem leafless, 1-fl'd, 5—15 cm. Perenn. pls 2
- Stem leafy, gen. many-fl'd, 30—100 cm. Ann. pls 3
2. Pets white, with a yellow base. Ls glabr., rarely hairy (*Pilatus*!), almost 2-pinnatifid, with linear divisions. —Detritus in the High Alp., calc.; almost the whole northern chain. 7 *alpinum* L. 90.

- Pets yellow, orange-yellow when dried. Ls hairy, simply pinnatipartite, with broad-lanceolate divisions. *P. pyrenaicum* auct. not Willd.*)—As the last, but only in the Engadine. 7 *rhæticum* Leresche. 91.
- 3. Caul. ls clasping, glabr., undiv., sometimes slightly incised. Pets white, violet or red. Type of *P. somniferum* 4
- Caul. ls not clasping, hairy, 1- or 2-pinnatipartite. Pets red, often with a black spot near the claw 5
- 4. Caps. relatively small, opening by pores. Seed blackish blue. Ornamental pls (the typical form *P. silvestre* Dalech., is spontaneous in northern Italy). 6 . . . † *hortense* Huss. 92.
- Caps. larger, ovoid, without pores. Seed maturing without becoming darker. *P. officinale* Gmel.—Asia; cultivated for the oil obtained from its seeds. 6 † *somniferum* L. 93.
- 5. Stas dilated towards the top but contracted again below the anthers. Caps. rough with stiff bristles, near the top at any rate 6
- Stas not varying in thickness, filiform. Caps. glabrous 7
- 6. Caps. long, clavate, rough with erect-spreading hairs. —Fields and uncultivated places; not everywhere (wanting in U. A.). 5 *Argemone* L. 94.
- Caps. short, ovoid, with stiff and very spreading hairs. —Wall. (Sion, Sierre, Brigue, &c.). 5 . . . *hybridum* L. 95.
- 7. Caps. short, obovoid, rounded at the base. Stig. 8—12-rayed. Peduncle-hairs gen. horizontal.—Fields and uncultivated places; distrib. 6 *Rhoeas* L. 96.
- Caps. long, clavate, more or less narrowed towards the base. Stig. 5—9-rayed. Peduncle-hairs gen. applied. Type of *P. dubium* L. 8
- 8. Stigmatic rays reaching to the edge of the caps. Juice of the pl. white, soon turning yellow.—As the last; W. V. S Biel, Bâle, Schaffh. 6 . . . *Lecoquii* Lamot. 97.
- Stig. rays not reaching the edge of the caps. Juice colourless or greenish, turning white. Ls more div. than in the last.—b. *Lamottei* Bor. L-lobes more distant from one another. Caps. slenderer.—As the last; localities still to be verified; G. W. Bâle, Schaffh. 6 . . . *collinum* Bogenh. 98.

26. *Glaucium*. *Glaucium*. XIII, 7.

- 1. Caul. ls clasping, the base deeply cordate. Cor. large, yellow. Fr. covered with tubercles (18—30 cm long). *G. luteum* Scop.—Gravel; shores of the lake of Neuchâtel. 6 *flavum* Crantz. 99.

*) The *P. suaveolens* Lap. of the Pyrenees has smaller, narrower pets and shorter stas.—*F. Burseri* Rchb. appears to be a *P. rhæticum* with white flowers?

- Caul. ls with truncate or slightly cordate base. Pets smaller, scarlet, with a black spot at the base, and a white border in front. Fr. scabrous-hispid.—Fields; central Wall. 6 . . . *corniculatum* Curt. 100.

27. *Cheledónium*. *Celandine*. XIII, 7.

1. Ls pinnatisect; segments unequally lobed-crenate, more rarely (v. *laciniatum* Mill.) irreg. pinnatifid. Pls with orange coloured, milky juice.—Rubbish heaps; walls; everywhere. 5 . . . *majus* L. 101.

5. *Fumariaceæ*.

28. *Corydalis*. *Corydal*. XVII, 2.

1. Stem gen. simple with a tuberous rt. Fls red, lilac or whitish . . . 2
 — Stem branched; rt. not tuberous Fls yellow . . . 4
 2. Tuber soon becoming hollow. Stem with no scales at the base. Bracts undiv.—Orchards, hedges; almost everywhere. 4 . . . *cava* Schw. Krt. 102.
 — Tuber solid. Stem with a spur-like scale near the base . . . 3
 3. Raceme many-fld, erect at maturity. Bracts gen. incisodigitate.—b. *australis* Hausm. Fls white, streaked with rose; seeds 1-seriate.—As the last; western part of Switz. as far as Aargau. b. Wall. 4 *sólida* Sw. 103.
 — Raceme few-fld, drooping at maturity. Bracts entire; rarely one or other incised in front. F. *intermedia* Mér.—Alp. and subalp. 5, 6 . . . *fabácea* Pers. 104.
 4 (1). Cor. yellow, orange at the tips. Seeds glittering, with spreading, toothed appendages.—Old walls, rocks; Tess., and naturalised here and there. 6 *lútea* Dec. 105.
 — Cor. yellowish white, darker at the tips. Seeds almost dull, with applied, almost entire, appendages.—As the last; reported from M. Generoso. 6 . . . *ochroleuca* Koch. 106.

29. *Fumária*. *Fumitory*. XVII, 2.

1. Fr. smooth at maturity. Peduncles reflexed! Fl. 10—12 mm. Seps about $\frac{1}{2}$ as long as the cor. F. *pallidiflora* Jord.; v. *speciosa* Jord. (with dark red fls), Geneva.—Uncultivated places; rubbish heaps; Tess. Lausanne, Geneva, Altorf. 6 . . . *capreolata* L. 107.
 — Fr. at maturity (especially when dried) wrinkled. Peduncles erect-spreading. Fls smaller . . . 2
 2. Seps from $\frac{1}{4}$ to almost $\frac{1}{2}$ the length of the cor. (without counting the spur) . . . 3
 — Seps only $\frac{1}{8}$ — $\frac{1}{5}$ the length of the cor. (Fls 5—6 mm long, smaller than in F. *officinalis*. Fr. globular.) 4

3. Fr. broader than long, distinctly depressed at the top! Fls 7—8 *mm* long, purplish.—As the last, everywhere. 4, 5
officinalis L. 108.
- Fr. globular, when young shortly apiculate, when mature flattened-obtuse at the top. Fls 5—6 *mm*, paler than in the last. Seps smaller. Pl. with spreading, often climbing branches.—As the last; Bâle. 5 *Wirtgeni* Koch. 109.
4. Bracts $\frac{1}{2}$ — $\frac{3}{4}$ the length of the peduncle of the young fr. Fls pale rose-coloured. Glaucous pls. Racemes few-fl'd. Seps extremely small.—b. *Laggeri* Jord. (Chavini Reut.) Racemes bearing more fls; peduncles slighter.—As the last, especially on calc. (wanting in T. U.) b. *Engadine*, Visperthal, Salève. 5 *Vaillantii* Lois. 110.
- Bracts only about $\frac{1}{3}$ as long as the slender peduncle. Fls bright rose-coloured. Fr. with a persistent point. Pls of a lighter green than the last; branches more spreading; racemes longer and with more fls; seps rather larger.—As the last; G. W. J. (Münsterthal, Engadine, Nicolaithal, Porrentruy, Saas). 5
Schleicheri Soy.-Will. 111.

6. Cruciferæ.

30. *Matthiöla*. Stock. XV, 47.

1. Fl. of a dirty violet colour. *M. varia* auct. not Dec.—W. (Binnthal, Simplon, Nicolaithal; the pl. of Piémont v. *pedemontana* has brownish fls). 6 *valesiaca* Boiss. 112.

31. *Cheiranthus*. Wallflower. XV, 36.

1. Fls uniformly yellow or (b. *hortensis*) more or less variegated with red-brown.—Walls and rocks; western Switz.; Wall.; ornamental pls. 5 . . . *Cheiri* L. 113.

32. *Nasturtium*. Watercress. XV, 10, 44, 56.

1. Fls white. Ls. pinnatisect, with 2—3 pairs of segments the terminal segment oval-cordate or (b. *siifolium* Rchb.) with 4—6 pairs of almost equal, oblong-lanceolate segments.—Easily distinguished from *Cardamine amara* by its much smaller fls and yellow anthers.—Ditches and brooks with pure water; distrib. 6
officinale R. Br. 114.
- Fls yellow. *Roripa* 2
2. Pets only as long as the seps. Siliquas inflated, embossed, about as long as the peduncles.—Damp places, rubbish heaps; distrib. 6 *palustre* Dec. 115.
- Pets almost twice as long as seps 3

3. Siliquas linear or linear-oblong, as long or rather longer than the peduncles, or at least a good half the length of the peduncles. Type of *N. sylvestre* 4
- Siliquas (or silicules!) oval or oblong, only $\frac{1}{3}$ or $\frac{1}{4}$ the length of their peduncles 5
4. Peduncles of the fr. standing almost horizontal or slightly bent downwards. Siliquas shorter than their peduncles. Ls lyrate-pinnatifid (terminal segment large). *N. anceps* auct. p.—Damp places, water side, *e. g.* shores of Lake Constance and the Rhine; hitherto confused with the following. Lucerne (Langnau). 6 *riparium* Greml. 116.
- Peduncles of the fr. simply spreading, forming a sharp angle with the axis. Siliquas gen. as long or longer than their peduncles. Ls deeply pinnatifid.—As the last; localities still to be verified. 6 *sylvestre*. R. Br. 117.
5. Cauline ls pinnatifid, with linear, gen. entire, divisions. Stem 1—3 dm.—Gravel, pasturages; Italian Switz., Wallis, Monthey (lower Rhone valley), Realp. 6 *pyrenaicum* R. Br. 118.
- Ls all undiv.; or (in the aquatic form) the lower ls pectinate- or lyrate-pinnatifid. Stem 4—8 dm.—By and in the water; here and there (wanting in G. U. L.). 6 *amphibium* R. Br. 119.

OBS. To be further investigated: *N. amphibium-palustre* (anceps Wahlb.), *amphib.-sylvestre* (barbaræoides Tausch), and *palustre-sylvestre* (brachystylum Wall.r.).

33. Barbarea. Wintercress. XV, 41.

1. Fructiferous peduncles thinner than the ripe siliquas. Upper ls angularly toothed or almost pinnatifid, the lower with 2—4 pairs of segments 2
- Fr. peduncles almost as thick as the ripe siliquas. Upper ls pinnatifid, the lower with 4—8 pairs of lobes 4
2. Pets light yellow only $\frac{1}{3}$ longer than the seps (5—6 mm). Lateral lobes of lower ls very small, the last pair shorter than the terminal lobe. Siliquas erect. Hoods of seps bearing a tuft of hairs.—Damp places, ditches, road-sides; reported from near Aarau, Baar, Chur 5 *stricta* Andr. 120.
- Pets golden yellow, twice as long as the seps (7—9 mm). Lateral lobes of the lower ls larger, the last pair as large as the terminal lobe 3
3. Raceme dense at the commencement of flowering. Siliquas erect-spreading, straight. Terminal lobe of the lower ls round-oval, often cordate at the base. As the last; everywhere. 5 *vulgaris* R. Br. 121.
- Raceme looser at the commencement of flowering. Siliquas spreading, arched-ascending, longer than in the last (30 mm). Terminal lobe of the lower ls oval-rhomboidal.

—As the last; reported from near Bremgarten (Aargau), Vevey, neighbourhood of Geneva, and near Radolfingen, Canton Bern. 5 *arcuata* Rchb. 122.

- 4 (1). Siliquas numerous, crowded, fairly erect (25—30 mm). Lower ls with 4—5 pairs of segments. *B. augustana* Boiss., sicola G. G.—Great St. Bernard. J. 5

intermedia Bor. 123.

- Siliquas less numerous, less crowded, longer (40—70 mm). Lower ls with 4—8 pairs of segments.—Rubbish heaps, adventitious; near Vevey, Geneva, Bâle. 5 * *præcox* R. Br. 124.

34. *Turritis*. *Turritis*. XV, 56.

1. Rad. ls gen. runcinate, covered with stellate hairs; caul. ls entire, sagittate, glabr., glaucous. Siliquas erect, 60—90 mm long.—Stony places, thickets; distrib. 6
glabra L. 125.

35. *Arabis*. *Rock-cress*. XV, 51, 53.

1. Caul. ls with cordate or cordate-sagittate base, auricled-clasping 2
— Caul. ls narrowed-cuneiform at the base, or rounded, without auricles 8
2. Stem and ls glabrous; ls entire, the lower ones narrowed to a fairly long petiole. Habits of *Turritis*.—Stony, mountainous places, rare; G. W. V. B. O. S. (?). 5
brassicæformis Wallr. 126.
— Stem and ls more or less hairy 3
3. Siliquas arched and turned down on one side (100 to 150 mm).—Stony places, thickets; on calc., especially in the Jura (wanting in S.). 5 . . . *Turrita* L. 127.
— Siliquas erect or spreading 4
4. Fls 8—10 mm long. Perenn. pls, flourishing on sterile places. Cal. distinctly saccate at the base.—Rocky places in the Alp., subalp. and Jura, descending to the plains. 4—6. *A. albida* Stev. which resembles it (differing in the ls which are tomentose and have only 2—3 teeth on each side, and in the almost wingless seeds). Ornamental asiatic pls, sometimes subsponaneous *alpina* L. 128.
— Fls 4—6 mm long. Ann. or bienn. pls, rarely perenn., without barren shoots 5
5. Siliquas spreading, rather distant from one another. Ann. pls, the rad. ls often withered at the flowering period 6
— Siliquas erect, in dense racemes Pls at least bienn.; rad. ls in dense rosettes. Type of *A. hirsuta* . . . 7
6. Fr.-peduncles 3—5 mm long, almost as broad as the siliquas. Stem slender, 10—30 cm. Axis of the fr.-raceme bent in zigzag.—Stony places; rare; G. W. J. A. 4
auriculata Lam. 129.

- Fr.-peduncles 8—12 *mm*, distinctly narrower than the siliquas. Stem 20—50 *cm*. Axis of the fr.-raceme fairly straight — Alp. and subalp.; G. W. V. B. O. J. (Soloth.). 5 **saxatilis All.** 130.
- 7. Caul ls truncate-auricled at the base or slightly cordate. Siliquas 30—50 *mm*; stem 30—60 *cm*.—b. *incana Roth*. A more stunted mountain form; see N. Beitr. I. 3.—Grassy slopes, road-sides; distrib. 5 **hirsuta Scop.** 131.
- Cauline ls cordate-sagittate at the base, with pointed auricles. Siliquas 60—80 *mm*. Stem 60—80 *cm*.—As the last; rarer; W. V. A. 5 . . . **sagittata Dec.** 132.
- 8 (1). Rad. ls lyrate-runcinate, or undiv., but then distinctly petioled. Fls rose-coloured, rarely white . . . **9**
- Ls entire, toothed or sinuate-dentate. Fls white, rarely streaked with rose, or yellowish white . . . **10**
- 9. Rad. ls oblong-obovate in contour, lyrate-pinnatifid, with 3—9 lobes on each side. Fls fairly large, gen. rose-coloured. Rocky, sandy places, rare; near Aarau, Aarbourg, Burgdorf, by the Emme, Birs, at Doubs. 3 **arenosa Scop.** 133.
- Rad. ls or their terminal lobe roundish or oval, the rachis bearing 1—3 lateral lobes on each side, and then the ls lyrate. Fls smaller, white.—Upper Engadine, southern side of the Simplon. 6 . . . **Halléri L.** 134.
- 10. Seed surrounded by a broad membranous wing. (Alpine pls) . . . **11**
- Seed wingless or surrounded by a narrow wing, sometimes rather broader at the top . . . **13**
- 11. Fls bluish, 4—5 *mm* long. Pets oblong-cuneiform. Rad. ls with 3 teeth towards the top. Stem 3—10 *cm*.—High Alp. 7 . . . **coerulea All.** 135.
- Fls white. Pets oblong-obovate. Rad. ls entire or slightly toothed . . . **12**
- 12. Ls more or less hairy; the cauline 2—3, not clasping. Fls almost as large as in 128. Stem 5—10 *cm*.—Alp. 6 **pumila Jacq.** 136.
- Ls almost glabrous; the cauline 8—12, half-clasping. Fls smaller than in the last. Stem 15—25 *cm*.—Alp. 7 **bellidifolia Jacq.** 137.
- 13 (10). Peduncles 2—3 times as long as the calyx. Comp. genus *Stenophragma*.
- Peduncles about as long as the calyx . . . **14**
- 14. Siliquas erect-applied, parallel to the axis . . . **15**
- Siliquas spreading or erect-spreading, standing away from the axis . . . **16**
- 15. Ls toothed, the caul. truncate at the base. Fls small. Comp. *A. hirsuta*. 7.
- Ls more deeply toothed, the caul. rounded at the base.

- Fls distinctly larger than in N^o 131.—Walls, rocks;
 W. V. 5 **muralis** Bert. 138.
- 16 Seed narrowly winged towards the top. Ls shining,
 covered with scattered hairs; the cauline only 1—3.
 Racemes few-fl'd.—Salève near Geneva. 5
 ***stricta** Huds. 139.
- Seed entirely wingless, at most with a dark line round
 the edge **17**
17. Stem slender, rather flexible. Fr.-peduncles spreading.
 Resembling an *A. alpina* in miniature.—Alp. and subalp.
 (W. V. B. O. U.) Dôle, Salève. 6 **serpyllifolia** Vill. 140.
- Stem firmer, almost straight. Fr.-peduncles erect, shorter
 than in the last. *A. arcuata* Shuttlw., *ciliata* auct. not
 R. Br. Resembling *A. hirsuta* but the caul. ls neither
 truncate nor auricled at the base, siliques shorter, in
 a denser raceme, slightly spreading, the seed entirely
 wingless.—Var.: Stems and ls hairy (*v. vestita*); and
 stem glabr., ls ciliate (*v. glabrata*); also *b. cenisia* Reut.
A. dwarf pl., siliques almost fascicled.—Alp., subalp
 and Jura. *b. Colombier*, Upper Engadine. 6
alpestris Rchb. 141.

OBS. *A. stricta-muralis* (hybrida Reut.).

36. Cardamine. Bitter-cress. XV, 49.

1. Ls all, or at any rate the earliest, undivided **2**
 — Ls all pinnatisect **4**
 — Rad. ls ternate, with roundish-rhomboidal leaflets. Fls
 large.—Brenets, Jura of Neuchâtel (Tripet)
trifolia L. 141 (2).
2. Stem 20—40 cm. Fls 8—10 mm long. Anthers violet.—
 Presaccio in Poschiavo. 6 **asarifolia** L. 142.
 — Stem 2—12 cm. Fls 4—5 mm long. Anthers yellow **3**
3. Ls all undiv., or the cauline indistinctly 3-lobed. Seed
 wingless.—High Alp. 7 **alpina** Willd. 143.
 — Cauline ls pinnatisect, with 2—3 pairs. Seed narrowly
 winged at the top.—Alp. 7 **resedifolia** L. 144.
- 4 (1). Pets narrow, small (3—5 mm) **5**
 — Pets broader, larger (9—17 mm) **7**
5. Petioles sagittate-auricled at the base. L.-seg-
 ments 11—19.—Shady places; edges of brooks; distrib.
 but not common. 5 **impatiens** L. 145.
 — Petioles not auricled. L.-segments 5—11 **6**
6. Stem bearing 1—3 fls, gen. with numerous lateral as-
 cending stems, and numerous rad. ls. Stas gen. 4. Fr.-
 peduncles erect—Fields, grassy places, vineyards, woods;
 distrib. 4 **hirsuta** L. 146.

- Stem gen. taller and more leafy than in the last, sometimes branchy, the rad. ls less numerous, rather flexible. Stas 6.—Fr.-peduncles spreading.—Woods; fairly distrib. 5, 6 *sylvatica* Link. 147.
- 7 (4). Fls lilac, more rarely white. Anthers yellow. Segments of the cauline ls 9—25, gen. linear, entire.—b. *Matthioli* Moretti. Segments of caul. ls narrower, terminal lobe of rad. ls scarcely larger than the others; fls smaller, gen. white, more commonly red than lilac.—c. *fossicola* God. See N. Beitr. III, 3.—Damp meadows; everywhere; b. Tess., Wall., Vaud, Geneva. 4
pratensis L. 148.
- Fls white, rarely slightly rose-coloured. Anthers violet, then blackish. Segments of the caul. ls 7—17, oblong or oblong-oval, with angular teeth.—Springs and brooks; distrib. 5, 6 *amara* L. 149.

OBS. *C. amara-hirsuta*.

37. *Dentária*. Tooth-wort. XV, 49.

- 1. Ls palmatisect. Fls lilac-rose.—Mountain woods; distrib. 4, 5 *digitata* Lam. 150.
- Lower ls pinnatisect, upper undivided. Fls lilac or whitish. Ls bearing a bulbil in their axils.—Mountain forests; St. Gallen, Tess. 4 *bulbifera* L. 151.
- Ls all pinnatisect 2
- 2. Fls white or pale lilac. Leaf segments 5—7, short-acuminate.—Mountain forests, gen. rarer than 150 (wanting in O. L. U. A.). 4, 5 *pinnata* Lam. 152.
- Fls yellowish white. Leaf segments 7—9, long-acuminate.—Mountain forests, rare; G. T. U. Z. A. 4
polyphylla W. K. 153.

OBS. Hybrid: *D. digitata-pinnata* (digenea Gremlí, *intermedia* auct. not Sond.); *digitata-polyphylla* (Killiasii Brügg.).

38. *Hesperis*. Hesperis. XV, 47.

- 1. Ls oval-lanceolate, acuminate, toothed. Fls large, white or lilac-violet.—Water-side, way-sides; here and there, probably naturalised. 5 *matronalis* L. 154.

39. *Sisymbrium*. *Sisymbrium*. XV, 40^a, 43, 53.

- 1. Fls white. Caul. ls pinnatipartite. *Braya pinnatifida* Koch.—Alp.; W. V. 7 *pinnatifidum* Dec. 155.
- Fls yellow or yellowish white 2
- 2. Ls all undiv., oblong-lanceolate.—Road-sides, thickets; G. S. (Engadine, Poschiavo; Schleithem). 6
strictissimum L. 156.

- Ls 2—3-pinnatipartite, with linear segments.—Road-sides, rubbish heaps, not everywhere (wanting in U. L. Z. S.). 5, 6 **Sóphia L.** 157.
- Ls runcinate-pinnatifid (in 159 the upper pinnatisect with linear segments) **3**
- 3. Siliquas narrowed towards the top, conic-subulate. Peduncles short, not more than 3 mm.—Road-sides, rubbish heaps; everywhere. 5, 6 **officinale Scop.** 158.
- Siliquas not varying in thickness, linear **4**
- 4. Fr.-peduncles as thick as the siliquas. *S. pannonicum* Jacq.—Road-sides, rubbish heaps; W. (Iserabloz, Stalden). 5 **Sinapistrum Crantz.** 159.
- Fr.-peduncles distinctly thinner than the siliquas **5**
- 5. Young siliquas exceeding the open fls.—As the last; W. (Viège). 5, 6 **Iris L.** 160.
- Young siliques not exceeding the open fls. *S. acutangulum* Gaud.—Stony, mountainous places; Wall., Salève, sometimes adventitious as also the two last. 6
austriacum Jacq. 161.

40. **Alliaria. Alliaria.** XV, 52.

1. Ls smelling of garlic when rubbed, the lower reniform, the upper cordate-oval. Fr.-peduncles short, thick. *Sisymbrium Alliaria* Scop.—Road-sides, hedges; everywhere. 4, 5 **officinalis Andr.** 162.

41. **Hugueninia. Hugueninia.** XV, 41.

1. Ls pinnatisect, with numerous lanceolate, inciso-dentate segments. Siliquas short, 7—8 mm.—Alp.; W. (St. Bernard, Bagnethal und Arollathal). 7 **tanacetifolia Rchb.** 163.

42. **Braya. Braya.** XV, 54.

1. Ls pinnatisect. Fls in the leaf-axils! *Sisymbrium supinum* L.—Gravel beds by the lake of Joux. 6, 7
supina Koch. 164.

43. **Stenophragma. Stenophragma.** XV, 53.

1. Ls oblong-lanceolate, denticulate. Peduncles thin. *Sisymbrium Thalianum* Gay.—Fields; distrib. 4, 5
Thalianum Celak. 165.

44. **Conringia. Conringia.** XV, 51.

1. Caul. ls cordate, deeply clasping. Pl. glaucous, entirely glabr. *Erysimum orientale* R. Br.—Fields; rare and gen. variable; near Geneva, Bern, Bâle, Schaffh., Constance, Zofingen. 6 **orientalis Rchb.** 166.

45. *Erysimum*. *Erysimum*. XV, 39.

1. Peduncles 2—3 times as long as the cal. Fls small.—Fields on the Swiss plateau, here and there; T. V. B. J. Z. S. *cheiranthoides* L. 167.
- Peduncles at most as long as the cal. Fls of moderate size, or large 2
2. Peduncles as long as the cal. Hairs on the ls all of the same form, 3-fid. Type of *E. hieracifolium* L. 3
- Peduncles $\frac{1}{2}$ — $\frac{1}{3}$ the length of the cal. Hairs on the ls almost all simple (or attached by the centre, the two ends spreading along the surface). Type of *E. Cheiranthus* 4
3. Ls almost entire. *E. longisiliquosum* Schleide. Siliquas 6—8 cm long).—Stony places, road sides; lower Engadine, Wall. 6 *virgatum* Roth. 168.
- Ls sinuate-dentate. Fls rather darker and smaller.—Stony places; formerly at the base of the vertical rocks of the Creux du Van. 6 *strictum* Fl. Wett. 169.
4. Branches of the rt-stock elongated, creeping. Siliquas compressed 4-cornered. Ls green, linear-lanceolate, slightly toothed.—Rubbish-slips in the Jura (Dôle, Chasseral, Creux du Van). 6 *ochroleucum* Dec. 170.
- Branches of the rt-stock short, crowded. Siliquas almost reg. 4-cornered 5
5. L.-axils with small barren branches, covered with small ls.—Waste ground; G. T. 6 *rheticum* Dec. 171.
- L.-axils without barren branches.—b. *pumilum* Gaud. (*Cheiranthus* Koch). Stem only 5—10 cm; fr.-raceme short. Styles shorter.—As the last; G. T. W. b High Alp. (Engadine, Zermatt). 6 *helveticum* Dec. 172.

46. *Brassica*. *Brassica*. XV, 39, 40.

1. Ls all petioled. Fr.-peduncles (and siliquas) erect. Siliquas 15—25 mm long. Seed blackish. *Sinapis nigra* L. Black mustard.—Rubbish heaps, road sides; rare (naturalised). 6.—*Erucastrum incanum* has a thickened peduncle, and a beak with 1—2 seeds at the base *nigra* Koch. 173.
- Upper ls. sessile. Fr.-peduncles spreading. Siliquas 60 to 100 mm long. Seeds brown 2
2. Upper ls narrowed or rounded at the base. Seps erect applied-closed. Racemes already elongated at the commencement of flowering.—Cultivated in many varieties; Cabbage, Kohl-rabi, Cauliflower. 4, 5 † *oleracea* L. 174.
- Upper ls clasping, the base deeply cordate. Seps spreading, half open or at last horizontal. Type of *B. campestris* 3

3. Fl.-raceme at first flat, the open fls slightly exceeding those not yet open. Ls of the first year grass-green, rough. Cultivated in several varieties. Rape. 4, 5
 † *Rapa* L. 175.
- Fl.-raceme elongated from the first, the open fls standing lower than the buds. Ls all glaucous . . . 4
4. Siliquas ascending; the beak about half as long as the siliqua. Lower ls with scattered hairs — Fields of Alpine valleys, especially in G. and W., sometimes very plentiful. 7 *campestris* Dec. 176.
- Siliquas spreading; beak about $\frac{1}{6}$ the length of the siliqua. Ls all glabr. — Cultivated in several varieties. Turnip. 7 † *Napus* L. 177.

47. *Sinapis*. Mustard. XV, 43.

1. Ls irreg. sinuate-dentate, the lower ones auricled or almost lyrate, the upper sessile. Siliquas with a conical, slightly compressed beak, shorter than the valves. Seed blackish brown. Field mustard. — Fields, often very plentiful. 5 *arvensis* L. 178.
- Ls pinnatifid, all petioled; segments 5—9, the upper ones confluent. Beak broad, sword-shaped, with two edges, as long as or longer than the valves. Seeds yellowish. White mustard. — Fields, here and there, probably, for the most part, an escape from cultivation. 6
alba L. 179.

48. *Erucastrum*. *Erucastrum*. XV, 42.

1. Siliquas applied. Ls lyrate, gray-pubescent, the upper linear-lanceolate. *Sinapis incana* L. *Hirschfeldia adpressa* Mönch. — Fields, especially among young lucern, rare (adventitious). 6 *incanum* Koch. 180.
- Siliquas spreading. Ls all sinuate-pinnatifid, or pinnatifid, with oblong, obtuse, unequally angular dentate segments 2
2. Fls lemon-yellow, without bracts. Seps spreading horizontally. — Road-sides, rubbish heaps, water side; distrib. 5, 6
obtusangulum Rchb. 181.
- Fls yellowish white, the lower ones with bracts, smaller than in the last. Seps almost erect. — As the last (wanting in T. W.). 5, 6 *Pollichii* Sch. and Sp. 182.

49. *Diplotaxis*. Rocket. XV, 44.

1. Peduncles about 2 or 3 times as long as the fls. Siliquas distinctly stipitate (3 mm) on the cal. — Road sides, rubbish heaps, walls; not everywhere, sometimes also adventitious. 5, 6 *tenuifolia* Dec. 183.

- Peduncles as long or slightly longer than the newly opened fl. Siliquas not stipitate on the cal. Stem gen. only leafy at the base, more rarely (in the hibernating pls) up to $\frac{1}{2}$ or $\frac{2}{3}$. Ls less glaucous and gen. not so much div. as in the last.—As the last. 6

muralis Dec. 184.

50. *Eruca*. *Eruca*. XV, 55.

1. Ls lyrate-pinnatifid. Fls dirty white, veined with violet! —Slopes, road sides, the lower Rhone valley. 5

sativa Lam. 185.

51. *Versicaria*. *Versicaria*. XV, 8.

1. Ls entire, the upper ones entirely glabr. Fls large. Silicules 8—12 mm long.—Rocky places; lower Rhone valley (Trientthal, Bad Lavey, Sembrancher). 4

utriculata Lam. 186.

52. *Alyssum*. *Alyssum*. XV, 30.

1. Cal. remaining till maturity. Stas all without wings or teeth; the 2 shorter stas with a subulate tooth on each side. Fls small; pets pale yellow, turning whiter.—Sunny places, distrib. 4, 5 . . . *calycinum* L. 187.
- Cal. decid. Stas with long wings, the shorter ones with a wing-like appendage at their base . . . 2
2. Fls small. Pets pale yellow. Silicules elliptic.—Alp.; Gelbe Wände near Zermatt. 7 . . . *alpestre* L. 188.
- Fls fairly large; pets of a fine yellow. Silicules orbicular . . . 3
3. Caul. ls gray with stellate hairs. Silicules thickly covered with stellate hairs.—Rocky places; Hohentwiel, Lägern, Istein, Arlesheim, Burgdorf, Simplan. 5 *montanum* L. 189
- Caul. ls green, with scattered stellate hairs. Silicules with scattered stellate hairs, becoming glabr.—Alp.; Gemmi: Bernoulli. 7 . . . **Wulfenianum* Bernh. 190.

53. *Bertéroa*. *Berteroa*. XV, 20.

1. Pl. gray with stellate hairs.—Road sides, rare and variable; near Martigny, Geneva, Morges, Solothurn, Zofingen. 6 . . . *incana* Dec. 191.

54. *Clypéola*. *Clypeola*. XV, 30.

1. Fls yellow, turning whiter. Silicules orbicular, suspended on arched peduncles. *C. Jonthalaspi* auct. not L.—Slopes; W. (Tourbillon, Gorges de Leytron, Montorge, St. Leonard, Sierre, Longeborgne, Saillon). 3, 4 *Gaudini* Trachsel. 192.

55. **Lunaria.** Moon-wort. XV, 19.

1. Silicules oblong-lanceolate, acute at both ends (50—60 *mm* long). Ls all petioled.—Mountain forests, not common (wanting in Z.). 5, 6 **rediviva** L. 193.
— Silicules broad-elliptic, obtuse at both ends. Upper ls sessile.—Rocky, wooded slopes; recently found again in Wall. near Orsières; Lugano: Mari. 4, 5
* **biennis** Mönch. 194.

56. **Petrocallis. Petrocallis. XV, 27.**

1. *Ls. cuneiform*, 3-fid.—Limestone detritus in the High Alp.; not everywhere. 6 . . *pyrenaica* R. Br. 195.

57. **Draba.** Whitlow-grass. XV, 27, 28.

1. Fls yellow. Ls stiff, ciliate-pectinate with stiff hairs. Type of *Draba aizoides* 2
 — Fls white, or turning rather greenish yellow when dried. Ls soft 3
 2. Style at least $1\frac{1}{2}$ as long as the breadth of the silicule. — *b. affinis* Host. (montana Koch). Fls larger. Fr.-raceme rather longer.—Calc. rocks of the Alp., subalp. and Jura, also descending lower; *b.* in the Jura. 3—7
 *aizoides* L. 196.
 — Style not $1\frac{1}{2}$ as long as the breadth of the silicule, thicker than in the last.—W. G. 7, 8
 *Zahlbrucknéri* Host. 197.
 3. Perenn. pls, with more or less numerous barren rosettes. Stem leafless or with few (1—2) ls. Alpine pls 4
 — Ann. pls, or at all events not long-lived. Barren rosettes 0 or few. Stem leafy 8
 4. Peduncles (and stem) hairy. (Style very short or almost 0). Type of *D. tomentosa* 5
 — Peduncles (and stem) glabrous 6
 5. Silicules oval, ciliate with simple hairs. Stem covered thickly with stellate hairs. Ls tomentose with stellate hairs. Fls fairly large.—*b. nivea* Saut. Cal. dark green. Fls larger, yellowish white when dried. Ls less tomentose; peduncles often glabr. (Graub.)—Calc. Alp. 7 *tomentosa* Wahl. 198.
 — Silicules oblong, glabr. Stem sparsely sprinkled with branched hairs. Fls rather smaller than in the last.—Alp. 7 *frigida* Saut. 199.
 6. Style distinct, about twice as long as broad. Fls $3\frac{1}{2}$ —4 mm long. *D. frigida* (or *tomentosa*?).—Johannis?—Alp.; Avers, Bernardin, Suleck, Rawyl and the valley of Saas. 7
 *Traunsteinéri* Hopp. 200.
 — Style very short or almost 0. Fls 2 mm long 7

7. Fr.-raceme very short, almost umbelled. Silicules oblong-oval. Ls glabr., only almost pectinate-ciliate with simple hairs (a. *homotricha* Linbl. = *D. helvetica* Schl.), or ciliate with simple and branched hairs, the inner ones of the rosette covered with a short, stellate pubescence (b. *heterotricha* Lindb. = *D. lapponica* Willd.).—High Alp. 7 **Wahlenbergii** Hartm. 201.
- Fr.-raceme oval or elongated. Silicules oblong-lanceolate. Ls with scattered stellate hairs, or (b. *glabrata* Koch) glabr. and only ciliate at the base with simple hairs. *D. carinthiaca* Hoppe.—High Alp. 7. **Johannis** Host. 202.
- 8 (3). Fr.—peduncles horizontal, twice as long as the silicule. Caul. ls auricled, half-clasping.—Stony places, walls; near Bâle, Charat (Wall.), also sometimes isolated and adventitious. 5 **muralis** L. 203.
- Fr.—peduncles erect-spreading, shorter than the silicule. Caul. ls not auricled **9**
9. Barren rosettes present. Silicules twisted, glabr. or pubescent.—Rocky mountain and alpine places; Château d'Oex, Körbliflüh, Ganterisch, Wasserberg, Axenflüh, Pilatus, Sentis lake. 6 **incana** L. 204.
- Barren rosettes 0. Silicules flat, pubescent.—As the last; Col Joata, Sampuoir, Zermatt, Saas? Gemmi? 6 **Thomasii** Koch. 205.

OBS. Hybrid: *D. aizoides-tomentosa* (setulosa Leresche); *D. aizoides-Johannis* (Graub.).

58. Eróphila. Erophila. XV, 20.

1. Ls in a radical rosette. Stem 2—15 cm. *Draba verna* L. —a. *majuscula* Jord. Pets 3 mm long. Ls obovate-spathulate, toothed, with abundant, partly 3-fid, hairs. b. *stenocarpa* Jord. Pets 2 mm long. Ls oblong-lanceolate, almost entire, with abundant 3-fid hairs. Silicules oblong-linear.—c. *glabrescens* Jord. Same characters, but ls glabr. or with some simple or 2-fid hairs; silicules elliptic-oval.—d. *præcox* Stev. (brachycarpa Jord.) Silicules oval or orbicular. Pls smaller, earlier.—Fields, grassy places, vineyards, walls; everywhere. 3 **verna** E. Mey. 206.

59. Cochleária. Scurvy-grass. XV, 14.

1. Rad. ls orbicular, cordate at the base; caul. ls toothed, cordate-clasping.—Springs and brooks in the subalp.; O. (Eriz, Justisthal, Rosenlauri). 5 **officinalis** L. 207.

60. **Kernéra. Kerneria.** XV, 11.

1. Rad. ls narrowed at the base; caul. linear-oblong, sometimes auricled at the base (v. *auriculata*).—Calcareous rocks of the Alp., subalp. and Jura. 5, 6
saxatilis Rchb. 208.

61. **Armoracia. Armoracia.** XV, 14.

1. Rad. ls large, oval-oblong, cordate, crenate; lower caul. pectinate-pinnatifid, upper linear-lanceolate, almost entire. *Cochlearia Armoracia* L.—Road sides, water side, here and there subspontaneous. 5 *rusticana* Fl. Wett. 209.

62. **Camelina. Camelina.** XV, 10.

1. Caul. ls linear-oblong, narrowed towards the base, then again enlarged, gen. sinuate-dentate or pinnatifid. Silicles inflated, truncate at the top, with thin valves. *C. foetida* Fr.—Fields, among flax, not common. 5, 6
dentata Pers. 210.
- Caul. ls oblong-lanceolate or lanceolate, denticulate or entire. Silicles rounded at the top 2
2. Pls almost glabr. Fr.-racemes several, slightly elongated. Silicles obovate, with the valves much swollen.—Fields, here and there, subspontaneous. 5, 6 *sativa* Crantz. 211.
- Pls more hairy. Fr.-racemes isolated or few, gen. much elongated. Silicles obovate-pyriform, valves less swollen and harder than in the last. Fls of a paler yellow. *C. sylvestris* Wallr.—Fields; G. W. V. S. Z. 5
microcarpa Andr. 212.

63. **Thlaspi. Penny-cress.** XV, 24, 25.

1. Silicles large (15—18 mm broad), broad-obcordate or almost orbicular, flattened and bordered all round with a broad wing. Seed covered with curved streaks! Stem angular.—Fields; everywhere. 5 . . . *arvense* L. 213.
- Silicles distinctly smaller, oblong-obcordate or obovate, slightly swollen at any rate on one side, wingless, or with a wing which disappears towards the base. Seed glabr. or spotted. Stem cylindric 2
2. Fls violet (very rarely white). Fr.-raceme dense, corymbiform. Silicles oblong-obovate, almost wingless, slightly or not at all indented at the top, style long, prominent.—b. *corymbosum* Gay (*cephæfolium* Moritzi). Divisions of the rt-stock shorter, pl. denser, stem straighter, rad. ls narrower.—Detritus in the Alp. and High Alp., especially calc.; b. Alp. on granite, near Zermatt. 6
rotundifolium Gaud. 214.
- Fls white. Fr.-raceme more or less elongated 3

3. Ann. pls, consequently without barren rosettes. Stem branchy in healthy specimens. Fls very small (3 mm long) Style 0.—Grassy places, road sides; everywhere. 4
perfoliatum L. 215.
- Bienn. or perenn. pls with barren rosettes (elongated in 216 in the form of stolons). Stem almost always simple. Stem more or less long, rarely short . . . 4
4. Silicules orbicular-obovate, rounded at the base; cells 1—2-seeded. Fls fairly large.—Hills, rocky places, Jura from Schaffh. to Creux du Van; rare in the Alp. (W? Pilatus). 4 **montanum L. 216.**
- Silicules oblong-obcordate, or obovate, narrowed towards the base; cells 2—8-seeded 5
5. Fr.-raceme elongated. Silicules rather broadly winged towards the top (wings about as broad as the cavity of the cell), distinctly indented at the top; style shorter or scarcely longer than the indentation. Fls smaller than in the last. Anthers gen. turning violet. Th. *Gaudinianum* Jord., *Lereschii* Reut.—b. *brachypetalum* Jord. Pets scarcely so long as the cal.; anthers remaining yellow (Wall. flowering early).—c. *Salisii* Brügg. (*rheticum* Jord.) Stem stiff, slightly branched. Racemes much elongated, fls dense and small; anthers remaining yellow; closely allied to Th. *perfoliatum* (upper Engadine).—Alp. and subalp., also lower (G. T. W. V. O. B.), southern and central Jura; wanting in the northern and N.E. Alp. 5, 6
alpestre L. 217.
- Fr.-raceme shorter, oblong. Silicules with narrow wings towards the top, slightly or not at all indented; styles prominent 6
6. Stas about as long as the, slightly cuneiform, pets; anthers turning violet. Th. *virens* Jord.?—Alp., Hospenthal, also indicated in Wall. 6 . . . **Mureti Greml. 218.**
- Stas distinctly shorter than the obovate pets; anthers always yellow. Th. *sylvium* Gaud. (High Alpine form?)—Alp.; Zermatt. 6 **alpinum Crantz. 219.**

OBS. *Th. alpinum-rotundifolium* corymb. Zermatt!

64. *Teesdålea*. *Teesdalea*. XV, 18.

1. Ls in a rosette, gen. lyrate-pinnatifid.—Fields; grassy places; Weil near Bâle. 4, 5 . . . **nudicaulis R. Br. 220.**

65. *Ibêris*. *Candy-tuft*. XV, 18.

1. Perenn. pls. Stems woody at the base. Ls entire, linear.—Rocky places in the Jura; only Ravellenfluh, Canton Soloth. 5 **saxatilis L. 221.**
- Ann. or bienn. pls. Stems herbaceous. Ls toothed or pinnatifid 2

2. Fr.-raceme stunted, almost in a corymb. Caul. ls linear with 2—3 linear lobes on each side. Lobules of the silicule slightly diverging.—Fields, railway embankments; rare. W. V. B. Z. 5 *pinnata* L. 222.
- Fr.-raceme more or less elongated 3
3. Ls deeply toothed or almost pinnatifid, with 2—4 lobes on each side. Fr.-raceme not much elongated. Lobules of the silicule slightly diverging. About equally related to 222 and 224. I. *ceratophylla* Reut., *affinis* Jord.?—Cheserex, Canton Vaud. 6 *panduriformis* Pour. 223.
- Ls crenate, with 2—3 notches on each side. Fr.-raceme rather elongated. Lobules of the silicule directed forwards, so that the indentation presents a sharper angle than in the last.—Fields, here and there (wanting in G. T. U. A. where it is only found occasionally). 5 *amara* L. 224.

66. *Biscutella*. *Biscutella*. XV, 31.

1. Rad. ls oblong-spathulate, entire or sinuate-dentate; caul. ls linear.—b. *lucida* Dec. Ls almost glabr.—c. *saxatilis* Schl. Silicules scabrous, covered with small tubercles. (Lower Wall.)—Rocky places of the Alp. and subalp. 5, 6 *laevigata* L. 225.

67. *Lepidium*. *Cress*. XV, 23. II, 6.

1. Caul. ls clasping, with a sagittate base 2
- Caul. ls neither clasping nor sagittate 3
2. Silicules not winged, cordate-oval, rather pointed. Style at least $\frac{2}{3}$ the length of the silicule.—Road sides, rubbish heaps; Sion, Bex, Vevey, Geneva, Yverdon, Bienne, Aarburg, Liestal, Bâle, Schleithelm, Zürich, Wollerau, Glarus, Chur. 6 *Draba* L. 226.
- Silicules winged, oval, indented at the top. Style very short.—Fields, road sides; distrib. 5
- campestre R. Br. 227.
3. Silicules broadly winged at the top. Anthers turning violet.—Cultivated. Cress. 6 † *sativum* L. 228.
- Silicules scarcely or not at all winged. Anthers yellow 4
4. Lower ls pinnatipartite or 2-pinnatipartite. Pets gen. 0. Stas gen. 2.—Roads, walls, rare; W. V. Bienne, Bâle. 5
- rudérale L. 229.
- Ls undiv. or the lower ones pinnatifid at the base 5
5. Caul. ls oval or oval-oblong. Silicules rounded.—Rocks, old castles, rare (naturalised); Freiburg, Burgdorf, Lenzburg, Laufen &c. 6 *latifolium* L. 230.
- Caul. ls linear. Silicules rather acute.—Road sides, walls, not common; T. W. V. 6, 7 *graminifolium* L. 231.

68. *Hutchinsia*. *Hutchinsia*. XV, 26.

1. Stem branched, leafy, 5—12 *cm.* Pets scarcely longer than the cal.—Stony or sandy places; W. V. 4
petraea R. Br. 232.
- Stem simple, leafless. Pets twice as long as the cal. 2
2. Fr.-raceme elongated, lax.—Alp. and Jura (Recullet). 6
alpina R. Br. 233.
- Fr.-raceme short, corymb-shaped. *H. affinis* Jord.—High Alp.; G. W. 7
brevicaulis Hoppe. 234.

69. *Capsella*. *Shepherd's purse*. XV, 26.

1. Silicules triangular-obovate 2
- Silicules oblong-oval or suborbicular 3
2. Pets twice as long as the seps. Lateral edges of the silicule almost straight.—Var. with ls sinuate-dentate, pinnatifid or runcinate-pinnatifid, more rarely almost entire. Pets sometimes modified to extra stas.—Fields, road sides; everywhere. 4—10 *Bursa-pastoris* Mönch. 235.
- Pets as long as, or hardly longer than, the seps; seps gen. reddish. Lateral edges of the silicule slightly curved inwards. Fl.-buds violet-brown, in 235 pale.—As the last. Tess. Lower Wall., Vaud, Geneva, Bâle, J. 4—6
rubella Reut. 236.
3. Raceme elongated, many-fld. Ls pinnatifid, rarely entire. —Waste saline ground; Freiburg (aux Rhames). 4
procumbens Fr. 237.
- Raceme short, 3—5-fld. Ls undiv. or the lower sometimes with 1 or 2 incisions.—Subalp.; G. (Tarasp, Fontana). 6 *pauciflora* Koch. 238.

OBS. *C. Bursa-pastoris*—*rubella* (*gracilis* Gren.).

70. *Aethionéma*. *Aethionema*. XV, 22.

1. Ls entire. Pl. glabr., glaucous.—Stony places in the mount. and subalp.; T. W. V. O. (Val Blegno; Lugano; Binnthal; Ganter; Fort de l'Ecluse; Kanderthal and Simmenthal). 5, 6 *saxatile* R. Br. 239.

71. *Senebiéra*. *Senebiera*. XV, 16.

1. Silicules rounded above (reniform); style short.—Footpaths, between the paving stones, not common; V. J. B. S. Z. T. 7 *Corónopus* Poir. 240.
- Silicules indented above and below (didymous); style 0. —As the last; but very rare and variable; Geneva, Lausanne, Bern. 7 * *didyma* Pers. 241.

72. Euclidium. Euclidium. XV, 13.

1. Ls oblong-lanceolate, entire. Silicules with short, thick peduncles.—Rubbish heaps, adventitious; Wollerau, Canton Schwytz, Vevey, Geneva. 6 . *syriacum* R. Br. 242.

73. Isatis. Woad. XV, 31.

1. Caul. ls deeply sagittate. Stem branched above in a corymb. I. Villarsii Gaud. (forma autumnalis).—Waste ground, road sides; Wall.; also here and there (especially on railway embankments) adventitious. 4, 5
tinctoria L. 243.

74. Myagrum. Myagrum. XV, 7.

1. Ls glaucous, glabr., the upper sagittate. Fr.—peduncles thick, almost club-shaped.—Fields; Delemont (probably adventitious). 4 *perfoliatum* L. 244.

75. Néslea. Neslea. XV, 5.

1. Caul. ls sagittate. Pl. covered with branched hairs. Vogelia paniculata Horn.—Fields; fairly distrib. (wanting in T. U. L.). 5, 6 *paniculata* Desv. 245.

76. Calepina. Calepina. XV, 12.

1. Rad. ls runcinate, the upper auricled-sagittate. Pl. glabr. Fls small.—Grassy places, railway embankments; Branson, Chamblande (Vaud), Leopoldshöhe near Bâle. 4, 5
Corvini Desv. 246.

77. Búnias. Bunias. XV, 6.

1. Rad. ls runcinate, the upper ones sessile. Erucago campestris Desv.—Fields; western and southern Switz. 6
Erucago L. 247.

78. Lælia. Lælia. XV, 9.

1. Rad. ls runcinate-pinnatifid. Stem 3—8 dm. Bunias orientalis L.—Rarely cultivated and subsontaneous. 6
† *orientalis* Desv. 248.

79. Rapistrum. Rapistrum. XV, 2.

1. Lower ls lyrate. Stem with spreading branches.—Fields, road sides; western Switz. W. Z. L., also sometimes adventitious. 6 *rugosum* Bergt. 249.
- Ls pinnatifid, acute. Style conic, shorter than the upper joint of the silicule. Silicule hairless.—Lausanne (Favrat); Morges (Jaccard). 6 *perenne* All. 249a.

80. **Raphanistrum. Raphanistrum. XV, 33.**

1. Ls lyrate. Pets white (rarely yellowish), veined with violet, rarely (*v. flavum* Sch. M.) sulphur yellow with darker veins. *Raphanus Raphanistrum* L.—Fields; everywhere. 6 **Lampsana Gärtn. 250.**

81. **Ráphanus. Radish. XV, 33.**

1. Ls lyrate.—Cultivated in several varieties (radish). 5, 6
† **sativus L. 251.**

7. **Cistaceæ.**82. **Cistus. Cistus. XIII, 10.**

1. Fls large, 40—45 mm in diam., white, with a yellow base.—Hills; T. (Locarno, Ascona). 5 **salvifolius L. 252.**

83. **Heliánthemum. Rock-rose. XIII, 10.**

1. Ls altern., linear, almost acicular. Fls solitary. *Fumana procumbens* Spach.—Sunny, rocky places; Chur, Tess., Rhone valley, from lake Lemman to Neuveville, lake of Thun, lake of Uri. 5, 6 . . . **Fumana Mill. 253.**
- Ls opp., oval, oblong or linear-oblong. Fls in racemes (sometimes few-fld) 2
2. Stipules 0. Type of *H. oelandicum* 3
- Stipules present 4
3. Ls gray-tomentose underneath with stellate hairs.—Jura (Dôle, Mont Tendre, Vaulion, Chasseron). 6
canum Dun. 254.
- Ls green underneath, with simple or fascicled hairs, more rarely (*b. glabratum*) glabr. or with hairs only at the edge, on the middle nerve and petiole. *H. alpestre* Rehb.—Alp and subalp. 6, 7 . . **oelandicum Wahl. 255.**
4. Style almost straight, shorter than the ovary. Ann. pls. Sunny places; Branson in Wall. 4, 5 **salicifolium Pers. 256.**
- Style curved in the shape of an S, 2—3 times as long as the ovary. Perenn. pls 5
5. Fl. light or dark yellow, very rarely white (*v. albiflorum* Koch.). Stipules lanceolate. Ls oval or oblong, flat or slightly rolled up, gen. green on both sides (*a. obscurum* Pers.), more rarely white tomentose with stellate hairs underneath (*b. tomentosum*).—Dry, sunny places; everywhere up to the Alp. where the fls are larger (*c. grandiflorum* Dec. if the ls are of an uniform colour d.; *Scopoli* Willk. if the ls are tomentose underneath). b. G. W. V. 6 **vulgare Dec. 257.**

- Fls white. Stipules subulate. Ls linear-oblong, more or less rolled up, gray-tomentose underneath with stellate hairs.—As the last; Tessin, Fort de l'Ecluse near Geneva. 5, 6 **polifolium Koch. 258.**

8. Violaceæ.

84. *Viola*. Pansy, Violet. V, 12.

1. Only the 2 upper pets directed upwards, the 2 lateral spreading horizontally or bent backwards. Fls gen. coloured, blue or violet, sometimes white.) **2**
- The 2 lateral pets directed upwards towards the 2 upper ones **21**
2. Seps obtuse. Ls and peduncles radical. (Stemless pls) **3**
- Seps acute. Ls and peduncles radical **12**
- Seps acute. Fls axillary on the stems; but the stems sometimes very short **13**
3. Ls digitate, multi-partite.—Alp.; G. W. 6 **pinnata L. 259.**
- Ls undiv., crenate **4**
4. Ls entirely glabr. Fr.-peduncles erect, with a 3-cornered, drooping caps.—Marshy places, especially of the mountains and subalp. (wanting in S.). 5, 6 **palustris L. 260.**
- Ls more or less pubescent. Fr.-peduncles and caps., which is almost globular and gen. pubescent, depressed **5**
5. Stolons 0 (rt-stock sometimes branched, with short or rather long, thick, knotted branches). Type of *V. hirta* *) **6**
- Pls with more or less elongated, thin, but sometimes subterranean, stolons. (Fls more or less scented.) Type of *V. odorata* **9**
6. Fr. (and ovary) glabr. Ls broad-oval, at last almost glabr., with a shallow, open incision at the base. Fls scented, with a white throat. *V. pyrenaica* Dec.—b. *glabrescens Fock.* Fls small, entirely blue. Shady places of mount. and subalp.; G. W. V. O. J. (?) U. 4, 5 **sciaphila Koch. 261.**
- Fr. (and ovary) pubescent **7**
7. Ls oval-oblong, slightly cordate at the base, the incision open. Stipules narrower, more finely attenuated and fringed with longer hairs than in *V. hirta*. Fls large, reddish-violet, very fragrant. *V. ambigua* Koch not W. K.—Alp. and subalp.; G. T. W. V. U. 5

Thomasiana Perr. Song. 262.

*) *V. permixta* Jord. (sepincola auct. helv. an Jord.?) without, or with short stolons, but with shorter hairs and broader ls than in the *V. hirta*, is a hybrid with *V. odorata*.

- Ls oval, deeply cordate at the base, the incision more or less narrow **8**
- 8. Fringes of the stipules filiform, gen. ending in a gland, not ciliate, the middle ones gen. shorter than the width of the stipule. Fls scentless, light or dark violet, rarely bluish or white. Stipules oval-lanceolate or lanceolate. *V. consimilis* Favrat exs. not Jord.—Mount., grassy places, thickets; everywhere. 4 **hirta** L. 263.
- Fringes of the stipules larger than in the last, gen. without glands, ciliate, the middle ones as long as the width of the stipule. Fls with a faint scent, light blue, rarely (*V. declivis* Du Moul.) white. Stipules narrower and more finely attenuated than in the last; summer ls gen. with a thicker pubescence.—As the last; G. W. V. O. U. Z. A. S. 4 **collina** Bess. *) 264.
- 9 (5). Stolons above-ground, not rooting (or only at a late period?), sometimes short, or indeed 0, often bearing fls. Ls with slightly elongated points! Stipules narrow, almost linear, with fringes almost as long as the width of the stipule.—a. *virescens* Jord. Fls white with a greenish spur; ls grass-green, almost glabr.—b. *scotophylla* Jord. (abortiva Reut.?) Fls white, or the unequal (spurred) pet. streaked with violet. Ls dark green, often (like the seps) streaked with violet, more hairy, with a longer point and the lobes of the incision closer together; the ls of the past summer gen. lasting till the time of flowering.—Hedges; mount., grassy places, walls; T. W. V. B. J. L. Z. A. (near Vevey both varieties are very plentiful and often growing together, without any intermediate forms!). 3, 4 **alba** Bess. 265.
- Stolons underground or prostrate and then rooting **10**
- 10. Stolons subterranean. Ls almost glabr., grass-green, cordate-oval (more acute than in 267). Fls blue, with a white throat, the spurred pet. beautifully streaked with violet. Cal green, with short appendages, applied against the petiole; spur short, cylindric. Bracts gen. below the middle of the peduncle. Stipules lanceolate. *V. odorata* Steveni Koch?—Shady places, hedges; lower Rhône-valley (from Aigle to Brieg). 4 **Beraudii** Bor.! 266.
- Stolons prostrate. Ls more or less hairy **11**
- 11. Ls broad, cordate-oval or reniform, obtuse, finely pubescent. Stipules broad, oval-lanceolate. Fls gen. dark violet.—b. *Favratii* Gremli. Some of the ls completely orbicular; stipules narrower. Cor. darker (Sion).—Hedges; grassy places; everywhere. 4 **odorata** L. 267.

*) Place here: *V. valesiaca* Haussknecht, which has almost the ls of *V. Thomasiana*.

- Ls cordate-oval, with sharper points and stronger hairs than in the last (resembling those of *V. alba scotophylla*!). Stipules lanceolate, narrowed, larger than in *V. alba*. Fls paler, gen. of a dirty violet colour, gen. lighter inside! *V. alba-odorata*!!—As the last; W. V. Z. 4
* *multicaulis* Jord. 268.
- 12 (2). Stemless pls (ls and fls rad.). Petioles glabr. Stipules fringed. Probably hybrid.—Wood-clearings; Beringerthal, Canton Schaffh. * *perplexa* Grml. 269.
- Pls at first stemless, afterwards developing a stem. Petioles with a 1-seriate pubescence. Stipules entire and ciliate, not fringed. See *V. mirabilis*. 13.
- 13 (2). Stem at first stunted (fls and ls rad.), later developing fl.-bearing branches ("stems"), with more or less suppressed fls. Fls fragrant. Stipules entire, ciliated, not fringed. Ls large, broad cordate-oval. Pls with brown-red scales at the base!—Mountain woods; fairly distrib. 4
mirabilis L. 270.
- Stem always developed, but sometimes short. Fls scentless. Stipules fringed or toothed 14
- 14. Pls with a rosette of rad. ls. Type of *V. sylvatica* 15
- Pls without a rad. rosette, and consequently with no rad. ls. Type of *V. canina* 17
- 15. Caps. pubescent-tomentose. Ls small, almost orbicular, fairly obtuse, covered, as also the stem and peduncles, with a short pubescence. Stipules broader than in the 2 following, with sparser and shorter fringes. Pl. gen. small.—Dry sandy places, water side; G. W. V. O. U. Z. 4, 5 *arenaria* Dec. 271.
- Caps. glabr. Ls glabr. or with scattered hairs, cordate-oval, more or less acute or acuminate. Stipules lanceolate-linear, with a subulate point, fringed-ciliate 16
- 16. Pets violet; spur of the same colour, rarely pale, rather slender, scarcely furrowed. Appendages of the cal. on the fr. small. *V. sylvestris* auct.—Woods, thickets; everywhere. 4, 5 *sylvatica* Fr. 272.
- Pets blue or violet-blue; spur (and throat) whitish, thick, furrowed. Appendages of the cal. on the fr. larger than in the last. Ls darker green, rather firmer, more obtuse; pets broader, the lateral ones more strongly bearded. —As the last and often with it, but rather more rare. 5
Riviniana Rchb. 273.
- 17 (14). Stipules of the middle caul. ls decidedly shorter than half the petiole. Stem gen. ascending. Differing from *V. sylvatica* in the want of a rad. rosette, the ls firmer, gen. smaller, more slightly toothed, less deeply cordate and more acute, gen. broader than long, and in the stipules being more herbaceous, with shorter

- fringes, the cor. light blue, with a spur which is always whitish, and an obtuse, apiculate caps. *V. nemoralis* Jord. (form with broader ls?)—Wood-edges, pasturages, peat-bogs, especially in the mount. and subalp.; distrib. but not common. 5, 6 **canina** L. 274.
- Stipules of the middle caul. ls at least half as long as the petiole, those of the upper ls quite as long as the petiole. Stem erect. **18**
18. Middle stipules about half as long as the petiole, or as long as it **19**
- Middle stipules foliaceous, as long as, or longer than, the petiole. (Fls pale blue) **20**
19. Ls dark green, rather firm, oblong-oval, scarcely or very slightly cordate at the base; edges of the ls slightly arched. Fls light blue, fairly large. *V. Ruppil* All., montana L.?—Alp. and subalp. (Zumdorf, Simplon, Bex); marshy fields near Colombey and Geneva. 5
- stricta** Horn. 275.
- Ls light green, thin, oblong-lanceolate, with slightly cordate or almost truncate base; edges of the ls almost straight. Fls milky white or rather bluish, smaller than in the last. *V. Billotii* F. Schultz (form with larger stipules).—Swampy meadows, rare; V. J. B. Z. 5
- stagnina** Kit. 276.
20. Ls lanceolate, with a truncate or slightly cuneiform base, decurrent on the petiole which is winged above. Stem 5—10 cm, glabr. like the ls. *V. pratensis* M. and K.—Swampy meadows; near Geneva, Bienne, Schaffh. 5
- pumila** Chaix. 277.
- Ls lanceolate, with a truncate or slightly cordate base. Stem 25—45 cm, more or less pubescent as also the ls. —Swampy meadows; Geneva, Orbe, Maienwand (herb. Boiss.). 5 **elator** Fr. 278.
- 21 (1). Stig. truncate, almost bilobed. Ls reniform, broader than long. Fls yellow, streaked with brown.—Shady, damp places in the Alp., subalp. and Jura; also descending lower. 6 **biflora** L. 279.
- Stig. almost globular, urceolate. Ls, at least the upper ones, longer than broad. Fls rarely uniformly yellow, gen. violet or variegated with violet, yellow and white **22**
22. Ls all entire. Spur about as long as the cor; cor. violet, never yellow.—Detritus in the High Alp.; not common. 7
- cenisia** L. 280.
- Ls crenate **23**
23. Spur as long as the cor.; cor. gen. very large (30—45 mm), violet-blue, rarely yellow or white. Stem gen. very short. —Alp. and Jura (Reculet), 6, 7 **calcarata** L. 281.

- Spur as long as the appendages of the cal. or almost half as long as the cor. 24
24. Stipules gen. lyrate-pinnatifid, terminal lobe gen. much larger, often foliaceous and crenate. Ann. or bienn. pls (also perenn. in the Alp.).—a. *valesiaca* Thom. Pets small, pale, scarcely as long as the cal.; pls small 3—8 cm, gen. covered with a dense pubescence; lower ls cordate-rounded.—b. *arvensis*. Pets scarcely longer than the cal., yellowish white, the 2 upper ones often partly violet. Middle lobe of the stipules foliaceous, crenate. c. *segetalis* Jord. Same characters but middle lobe of the stipules narrow, scarcely toothed. The same variety with larger, and more coloured fls constitutes *V. gracilescens* Jord.—d. *alpestris*. Fls larger, more brightly coloured; middle lobe of the stip. foliaceous, crenate.—e. *bella*. Like the last var. but the middle lobe of the stip. narrower, not or hardly toothed.—Fields, fallow; b. everywhere; a. Wall.; c. Vaud and Friburg rarer; d. and e. mount. and subalp. 5, 6 *tricolor* L. 282.
- Stipules almost palmate-multifid, with linear or linear-oblong lobes, the middle one not or scarcely longer than the others. Perenn. pls. (Rt-stock branched, creeping.)—Alp. on limestone; from Obwald to Gruyère, wanting in Wall., doubtful in Graub. 6 *lutea* Huds. 283.

OBS. *V. alba-hirta* (badensis Wiesb., intricata Arv.-Touv.), abortiva Jord. sec. Lamott., adulterina Godr.? vaudensis Haussk.?; *arenaria-Riviniana* (Burnati Grml.); *Beraudii-hirta* (according to Favrat and Wolf); *calcarata-tricolor* (Christii Wolf!) *hirta-odorata* (permixta Jord.); *mirabilis-sylvatica* (spuria Celak.); *mirabilis-Riviniana* (according to Schmidely); *Odorata-scotophylla*; *Odorata virescens*.

9. Resedaceæ.

85. Reseda. Mignonette. XI, 3.

1. Seps 4. Ls undiv., linear-lanceolate, with a small setaceous tooth on each side of the base.—Road sides; rubbish heaps. 6 *luteola* L. 284.
- Ls 1—2-pinnatifid, or at any rate 3-fid 2
2. Middle caul. ls 1—2-pinnatifid. Seed smooth.—Road sides, shores; distrib. 6 *lutea* L. 285.
- Middle caul. ls undiv. or 3-fid. Seed wrinkled 3
3. Divisions of the cal. enlarged at maturity (8—10 mm). Fls scentless. Seed $2\frac{1}{2}$ mm long.—As the last, rare and variable; V. 4, 5 *Phyteuma* L. 286.
- Divisions of the cal. not sensibly enlarged at maturity. Fls fragrant. Seed $1\frac{1}{2}$ mm long. An ornamental plant. 5—8
† *odorata* L. 287.

10. Droseraceæ.

86. *Drósera*. Sundew. V, 140.

1. Stem ascending, 4—7 *cm*, scarcely longer than the cuneiform, obovate ls. Caps. furrowed.—Peat-moss; M. Cenere, Stanz, Einsiedeln, Bilten, Robenhausen, Gonten, Altstätten. 7 *intermedia* Hayn. 288.
- Stem erect, 10—20 *cm*, 2—3 times as long as the ls 2
2. Ls spreading, almost orbicular, suddenly contracted to the petiole.—Peat-moss; distrib. 7 *rotundifolia* L. 289.
- Ls erect, obovate, about twice as long as broad, narrowed to the petiole. *D. anglica-rotundifolia*.—Peat-moss, rare; Vevey, Geneva; Hallwylersee, Katzenssee. 7.
* *obovata* M. K. 290.
- Ls erect, linear-oblong, 3—4 times as long as broad, narrowed insensibly to the petiole. *D. longifolia* auct.—Peat-moss; distrib. 7 *anglica* Huds. 291.

87. *Parnassia*. Grass of Parnassus. V, 141.

1. Stem only bearing 1 leaf, and 1 white fl.—Varied with the fl. only a third the size (*v. alpina* Drude).—Marshy meadows; distrib. 7 *palustris* L. 292

11. Polygalaceæ.

88. *Polygala*. Milkwort. XVI, 11. XVII, 1.

1. Fls yellow or (especially in transalpine Switz.) more or less rose-coloured (*v. rhodoptera*), 1—2 together in the upper leaf-axils. Ls leathery, persist. *Chamæbuxus alpestris* Spach.—Wooded hills; distrib., but rather rare in the Jura. 4, 5 *Chamæbuxus* L. 293.
- Fls blue, rose or white, in racemes. Ls decid. in autumn 2
2. Racemes 3—8-flid, the terminal raceme at last (through the development of a large axillary fl.-bearing branch) appearing lateral. Lower ls gen. opp. *P. serpyllacea* Rchb.—Marshy fields, especially in the subalp., rare; Alpes d'Oillon, below Jaman, Voiron, Sonvilliers, Thun, Zug, Hohenrhône, 5, 6 *depressa* Wendr. 294.
- Racemes gen. many-flid (10 fls and more), terminal, rarely slightly exceeded by the fl.-bearing twigs. Ls all altern., or the lower ones in a rosette 3
3. Lateral nerves of the wings branched (at maturity), more or less anastomosed with the middle nerve (herb not bitter). Type of *P. vulgaris* 4

- Lateral nerves of the wings faintly branched, not anastomosed or scarcely so, *i. e.* united with the middle nerve by a scarcely visible vein. Type of *P. amara* . . . 7
4. Ls rather firm, the lower ones (below the point whence the fl.-bearing stems spring) larger than the others, rather crowded in a rosette; stems, beneath the rosettes, leafless. Fls almost as large as in *P. vulgaris*, of a fine blue.—Calc. hills in the Jura; Pruntrut, Fleurier. 5
calcarea F. Schultz, 295
- Lower ls relatively broader, but shorter than the upper ones, not in a rosette 5
5. Fls rose-coloured, large; wings 8—10 mm long, during their entire development round-oval. *P. nicæensis* Riss. var.? See N. Beitr. III, 4. IV, 2.—Val Calanca, Tess. Southern side of the Simplon. 6 **corsica Bor. 296**
- Fls distinctly smaller; wings 5—6 mm long, elliptic 6
6. Middle bracts longer than the pedicel of the newly-opened fl., exceeding the buds before the full development of the raceme, and so giving the top of the young raceme a conic, hairy appearance. Fls often rose-coloured, gen. more numerous than in the following. Wings with feebler net-veins, the middle nerve gen. only branched in its upper third part.—Pasturages, wood-sides; distrib. 5, 6
comosa Schrank. 297.
- Middle bracts scarcely as long as the pedicel of the newly-opened fl., not reaching beyond the buds, the end of the raceme consequently obtuse, not hairy. Fls most often blue.—b. *pseudoalpestris* Gren. Racemes shorter, denser.—As the last; distrib. 5, 6 **vulgaris L. 298.**
- 7 (3). Lower ls shorter than the others, not forming a rosette. Herb not bitter. Fls distinctly smaller than in the last. (Wings 4—5 mm.)—Alp., subalp. and Jura, especially on calc. 6 **alpestris Rchb. 299**
- Lower ls much larger than the others, obovate, obtuse, in a rosette 8
8. Fls almost as large or still larger than in *P. vulgaris*, gen. of a beautiful blue. Wings as broad or broader than the capsule. Herb bitter which, together with the the not, or only slightly, anastomosed nerves of the wings, distinguishes this species from 295.—Calc. mountains of Austria and Hungary; I have not yet seen a specimen in Switz.! 5, 6 *** amara Jacq, 300.**
- Fls distinctly smaller (wings 3—4 mm), blue, reddish, or whitish. Wings always narrower than the capsule 9
9. Racemes many-fl'd, more or less elongated. Herb gen. bitter. *P. amara* auct. plur. non Jacq., *uliginosa* Rchb. —Dry or damp pasturages up to the Alp. 5, 6
austriaca Crantz. 301

- Racemes 5—10-fl'd, short. Herb not bitter. Pls small, with many stems, spreading; the axis of each rosette bearing a barren branch.—High Alp., rare; Lavirum-pass, Bernina, Zwischbergen, Zermatt, Lenzer Alp., St. Bernard, Alp. of Bex, Col de Balme, above Fully, Bellalui. 6 *alpina* Perr. and Song. 302.

12. Silenaceæ.

89. Dianthus. Pink. X, 17.

1. Limb of the pets cut down to the middle or deeper 2
- Limb of the pets only toothed 3
2. Scales of the cal., together with their awns, $\frac{1}{4}$ — $\frac{1}{3}$ the length of the cal.-tube. Stem bearing several or many fls.—b. *grandiflorus* Tausch. (*D. speciosus* Rehb.) Stem bearing few or only 1 fl., fls larger, cal. brown-red, thicker, pets less deeply laciniate.—Damp meadows, wood clearings; distrib. 7, 8 *superbus* L. 303.
- Cal.-scales with their awns half as long as the cal.-tube. Stem 1- or few-fl'd. Pets less deeply divided than in the last—about to the middle with almost simple lobes.—b. *controversus* Gaud. Pets less deeply div. (not spotted). glabr. See N. Beitr. III, 44.—Thickets; Tess. (above Melano, S. Giorgio), Reculet and Colombier in the Jura. 7 *monspessulanus* L. 304.
3. Fls shortly pedicelled or almost sessile, agglomerated in a cluster or head 4
- Fls with more or less long pedicels, solitary at the end of the stem, or in a loose corymb 8
4. Ls broad, lanceolate, contracted at the base into a short petiole.—Veltlin, southern Tyrol; only subspontaneous in Switz. 6 † *barbatus* L. 305.
- Ls linear, or narrow linear-lanceolate, sessile 5
5. Floral ls and cal.-scales pubescent. Ann. or bienn. pls. Fls small.—Wood sides; fairly distrib. (wanting in G.) 6 *Arméria* L. 306.
- Fl.-ls and cal.-scales glabr. Perenn. pls 6
6. Ls shortly united at the base. Length of the sheath equal to the width of the ls. Fls in a loose fascicle, fl.-ls resembling the upper caul., herbaceous. *D. collinus* Gaud.—Slopes of transalpine Switz. 6 *Seguieri* Chaix. 307.
- Ls united for some length at the base, the sheath about 4 times as long as the width of the ls. Fls in a dense head. Floral ls as also the cal.-scales entirely leathery-scarious, yellowish brown. Type of *D. Carthusianorum* 7
7. Fls in clusters of 2—6. Stem indistinctly angular. Ls of a rather bluish green.—Hills, slopes; distrib. (wanting in U.) 6 *Carthusianorum* L. 308.

- Fls gen. in clusters of 10—25. Stem distinctly angular. Ls grass-green. *D. congestus* Bor., *atrorubens* Gaud. not All.—Valleys of the Alp.; G. T. W. U. 7
vaginatus Chaix. 309.
- Fls numerous. Stem tall, slender. Pets with a smaller, narrower limb, and longer claw than in the 2 last.—Tess. (Ponte Tresa!) . . . **atrorubens** All. 310.
- 8 (3). Stem rough with very short hairs, many-fld. Cal.-scales gen. 2, measuring together with their subulate awns, at least half the length of the cal.-tube.—Pasturages; wood sides; G. T. J. (Langenbruck near Bâle). Z. (Hard, near Bülach). L. (between Dagmersellen and Reiden). S. (Ramsen). Irchelhöhe. 6 . . . **deltoides** L. 311.
- Stem entirely glabr. 1- or few-fld . . . **9**
- 9. Cal.-scales, with their subulate awns, as long as or longer than the cal.-tube. Ls obtuse. Stem 3—5 cm.—High Alp.; rare. G. 7 . . . **glacialis** Hänk. 312.
- Cal.-scales, with their short, almost triangular points, $\frac{1}{4}$ or at most $\frac{1}{3}$ the length of the cal.-tube . . . **10**
- 10. Pets bearded at the base of the limb. Pls forming a loose tuft. Stem 10—15 cm, gen. 1-fld.—Rocky places; V. B. J. Z. S. A. (wanting in the Alp.); also occasionally subspontaneous on walls. 7 . . . **cæsius** L. 313.
- Pets not bearded . . . **11**
- 11. Pls forming a dense tuft. Rt-stock with short divisions. Ls rough at the edges. Stem 6—40 cm. *D. Scheuchzeri* Rchb., *caryophylloides* Rchb.—Hills and rocks in the Alp. and southern Jura, descending to the plains. 6 **sylvestris** Wulf. 314.
- Pls forming a loose tuft. Rt-stock with elongated divisions. Ls broader than in the last, smooth at the edges, or only slightly rough towards the base. Stem 40—60 cm.—Southern Europe; cultivated in many varieties and sometimes subspontaneous on old walls and castles. 6
† Caryophyllus L. 315.

OBS. Hybrid: *D. barbatus-superbus* (Courtoisii Rchb.; see N. Beitr. III, 5).
D. plumarius L., *chinensis* L. &c. are also cultivated in gardens.

90. **Tunica.** *Tunica*. X, 17.

- 1. Fls collected in a head-like fascicle of 3—8, almost entirely covered by scarious scales. *Dianthus prolifer* L.—Hills, wood sides and fields, not rare (wanting in G. U. A.). 6 . . . **prolifera** Scop. 316.
- Fls scattered, pedicelled. The *Gypsophila muralis* which resembles it, differs in the cal. being without bracts. *Gypsophila Saxifraga* L.—Hills in warmer districts; G. T. W. V. 7 . . . **Saxifraga** Scop. 317.

91. *Gypsóphyla*. *Gypsophyla*. X, 22.

1. Ann. pls. Stem 5—15 *cm*, slender, erect, dichotomous almost from the base, with scattered fls.—Fields, especially after the grass is cut; distrib. 6, 8 *muralis* L. 318.
- Perenn. pls. Stem 10—25 *cm* decumbent at the base then ascending, the fls collected in a corymb.—Rocky places of Alp. and subalp., descending with torrents into the plains; Dôle and Reculet in the Jura. 5, 6 *repens* L. 319.

92. *Vaccaria*. *Vaccaria*. X, 22.

1. Ann., glabr. pls. Fls of a light rose colour. *Saponaria Vaccaria* L.—Among corn; here and there (wanting in G. T. L.). 6 *parviflora* Mönch. 320.

93. *Saponaria*. Soap-wort. X, 21.

1. Stems almost erect, 40—60 *cm*. Cal. pale green or slightly reddish, glabr. or slightly pubescent, 20—25 *mm* long.—Slopes, hedges, water side; distrib. 7 *officinalis* L. 321.
- Stems branched, spreading, 25—35 *cm*. Cal. red, glandiferous, 6—11 *mm* long.—Rocky slopes of Alp. and Jura up to 2000 *m* (wanting in U.). 5, 6 *ocymoides* L. 322.

94. *Cucúbalus*. *Cucubalus*. X, 19.

1. Stem with spreading branches, climbing. Fls greenish.—Thickets; Tess. Geneva. 7 *baccifer* L. 323.

95. *Siléne*. Catchfly. X, 20. XXII, 26.

1. Cal. with 20—30 nerves 2
- Cal. with 10 nerves 4
2. Cal. conic, narrowed towards the top, with 30 simple nerves and a short pubescence. Pets indented, rose-coloured.—Chur, Geneva (adventitious). 6 * *cónica* L. 324.
- Cal. campanulate-ovoid, inflated, glabr. with 20 anastomosed nerves (net-veined) from the base. Pets 2-fid, white, rarely streaked with rose. Type of *S. inflata* 3
3. Stems erect-ascending, several—many-fld, fls 30—50 *cm*. Seed rough with conic tubercles.—Uncultivated places, road sides; everywhere. 6 *inflata* Sm. 325.
- Stems prostrate-ascending, cæspitose, with 1—3 fls, 10—20 *cm*. Seed covered with obtuse tubercles.—? b. *glauca* Jord. Stems with 3—5 fls. Pets with 2 pointed coronas at the base of the limb which are wanting in the type and in *S. inflata*, where they are only represented by 2 obtuse and indistinct bosses.—Detritus of the Alp.; b. Jura. 7 *alpina* Thom. 326.

- 4 (1). Fls imperfectly diœcious. Pets linear, undiv., greenish yellow, with no signs of a corona. *S. Pseudo-Otites* Bess.—Sandy hills; G. T. W. V. S. 6 . . . **Otites Sm.** 327.
- Fls hermaphrodite or polygam.-diœcious (hermaphrodite and 1-sexual). Pets more or less enlarged towards the tip, undiv., 4-toothed or 2-fid, often with a corona 5
5. Pls densely cæspitose. Stem very short or almost 0, always 1-fid. (Flowers rose-coloured). Type of *S. acaulis* 6
- Pls not densely cæspitose. Stem distinct, 10—60 cm and more, 1—many-fid 7
6. Cal. truncate at the base, almost umbilic. Caps. oblong-cylindric, almost twice as long as the cal.—b. *bryoides* Jord. Cal. narrowed towards the base. Pets not indented. Caps. rather shorter.—Alp.; b. *Albula*, Jaman. 6, 7
acaulis L. 328.
- Cal. narrowed into the peduncle. Caps. ovoid, not or hardly longer than the cal. Pls very densely cæspitose like *Aretia*. Fls smaller and paler than in the last. *S. polytricoides* Zumagl.—High Alp. 7 **exscapa All.** 329.
7. Cal. turbinate (short, obconic) 8
- Cal. tubular, or tubular-campanulate, or clavate . . . 9
8. Pets (white) indented. Seed not crested. Ls oval, the lower ones narrowed towards the base. Stem dichotomous-corymbiform.—Rocky places of the Alp. and subalp., descending sometimes; rare on limestone; Passwang in the Jura. 7 **rupestris L.** 330.
- Pets 4-toothed. Seed bordered by a spiny crest. Comp. genus *Heliosperma*.
9. Cal. glabrous 10
- Cal. pubescent 11
10. Pets deeply 2-fid, white above, greenish below. Fls isolated or 2 or 3 together, with long peduncles. Ls linear. Perenn. pls, cæspitose, with thin stems, 10—20 cm. — Calc. hills of warm countries; G. T. W. (Sim-plon). 5 **Saxifraga L.** 331.
- Pets only indented, of a fine rose-colour. Fls numerous, in a more or less thickly fascicled corymb. Ls oval-oblong. Ann. pls; stem glutinous below the upper joints, 30—50 cm.—Rocky places, rare; T. W. V. B.; also cultivated for ornament. 6 **Arméria L.** 332.
11. Pets undiv. with entire or denticulate edges, rarely slightly incised, whitish or flesh-coloured or (b. *quinque-vulnera* L.) of a blood-red bordered with white. Fls in unilateral spiciform racemes.—Fields, rare and often variable. 6 **gallica L.** 333.
- Pets 2-fid or 2-partite 12

12. Fls solitary or 2—3 together (rarely 5), large (cal. 20—25 mm long). Pets rose-coloured above, blood-red beneath. Stem 5—12 cm.—Alp. W. (Simplon, Nicolaithal, Hérens, Bagnethal). 7 **valesia L. 334.**
 — Fls more numerous. Stem 30—60 cm **13**
 13. Ann. pls. Stem dichotomous-corymbiform. Comp. *Melandrium noctiflorum*.
 — Perenn. pls. Fls panicled **14**
 14. Panicle unilateral. Fls drooping at the time of opening. Cal. 8—12 mm long. Pets with a pointed corona. Carpophore about $\frac{1}{3}$ as long as the caps.—b. *livida Willd.* Pets greenish underneath (Tess.).—Hills, wood sides; distrib. 6 **nutans L. 335.**
 — Panicle turning to all sides, pyramid-like, with erect fls. Cal. 18—20 mm long. Pets without corona or only with small bosses. Carpophore as long or almost as long as the caps.—As the last; Tess. 5 **italica Pers. 336.**

96. *Heliosperma*. *Heliosperm*. X, 20.

1. Stems thin, forming a loose tuft. Ls linear, the lower ones lanceolate. Pets milky white, 4-toothed! *Silene quadrifida* L.—Damp calcareous rocks of the Alp. and subalp.; Reculet in the Jura. 6 **quadrifidum Rchb. 337.**

97. *Melándrium*. *Melandrium*. X, 20. XXII, 26.

1. Fls hermaphrodite. Styles 3. Pets dirty white or slightly rose-coloured. *Silene noctiflora* L.—Fields; distrib. but not common. 6, 9 **noctiflórum Fr. 338.**
 — Fls diœcious. Styles 5 (rarely by anomaly 6—8). *Lychnidis sp. auct.* **2**
 2. Fls white, very rarely rose coloured, open in the evening and rather fragrant. Caps. ovoid-conic, the teeth erect or slightly bent outwards. Seed with obtuse tubercles. *M. album* Garck.—Road sides; hedges; distrib. 6 **vespertinum Martens. 339.**
 — Fls rose-coloured, very rarely white, open during the day, scentless. Caps. globular-ovoid, with the teeth rolled outwards. Seed with sharp tubercles. *M. rubrum* Garck.—Damp thickets, wood edges, especially in the mount. region; distrib. 4—5, earlier than the last **diurnum Crép. 340.**

OBS. *M. diurnum-vespertinum* (dubium Hamp.).

98. *Viscária*. *Viscous Catch-fly*. X, 20.

1. Pets undiv. Stem glutinous below the upper joints, 30—50 cm. *Lychnis Viscaria*. L.—Slopes; G. T. W. V. J. S. Z. 5 **vulgaris Röhl. 341.**

- Pets 2-fid. Stem not glutinous, 5—15 *cm.*—Alp.; G. W. O. 7 *alpina* Fr. 342.

99. *Lychnis*. *Campion*. X, 20.

1. Pets rose-coloured, div. beyond the middle into 4 linear lobes.—Meadows; everywhere. 5 . . . *flos cúculi* L. 343.
 — Pets undiv., or 2-fid to the middle 2
 2. Pets undiv., at most faintly indented 3
 — Pets 2-fid, (with a corona) 5
 3. Segments of the cal. longer than the pets. Comp. the genus *Agrostemma*.
 — Segments of the cal. shorter than the pets 4
 4. Stems and ls whitish tomentose. Caps. 1-celled. *Coronaria tomentosa* A.Br.—Wooded hills; W.; also cultivated for ornament. 6 *Coronária* L. 344.
 — Stem glabr., glutinous below the upper joints. Caps. div. at the base into 5 cells. Comp. the genus *Viscaria*.
 5 (2). Fls red, hermaphrodite. Caps. opening by 5 teeth. Pl. villous-tomentose.—Sunny slopes of the Alp.; G. T. W. B. 7 *flos Jovis* L. 345.
 — Fls white or rose-coloured, diœcious. Caps. opening by 10 teeth. Genus *Melandrium*.

100. *Agrostemma*. *Corn-cockle*. X, 20.

1. Pets violet-red, truncate or lightly indented, shorter than the cal.-segments!—Among the corn; everywhere. 6
 *Githago* L. 346.

13. Alsinaceæ.

101. *Spérgula*. *Spurry*. X, 24.

1. Ls linear-filiform, appearing fascicled—a. *vulgaris* Bœnngh. Seed black, with scattered clavate warts, which are at first whitish and later light brown.—b. *sativa* Bœnngh. Seed entirely black without warts.—Fields; distrib.; rarely cultivated. 6 *arvensis* L. 347.

102. *Spergulária*. *Sand-spurry*. X, 24.

1. Seps white-scarious with a green nerve. Pets white. Habit of 365.—Fields; Cœuve, Canton Bern; Bruderholz, Canton Bâle. 5 *segetalis* Fenzl. 348.
 — Seps green-herbaceous, scarious at the edges, without or with a feeble nerve at the base. Pets rose.—Sandy places, pasturages, road-sides, not everywhere; G. T. W. V. B. O. U. Z. (Aargau). 5, 6 *rubra* Presl. 349.

103. *Sagina*. Pearlwort. IV, 23. X, 26.

1. Fls 4-merous, with 4 stas, rarely chance specimens 5-merous, with 5 stas. (Pets at most half as long as seps) **2**
- Fls 5-merous, with 10 stas **4**
2. Central axis reduced to a barren rosette; stems prostrate, rooting. Ls not ciliate, rarely (b. *bryoides* Fröl.) ciliate-denticulate.—Damp fields, road-sides, ditches; distrib. and as high as the Alp. 5 . . . *procumbens* L. 350.
- Central axis developed; central rosette 0; stems erect or ascending, not rooting **3**
3. Ls ciliate. Seps spread like a cross on the ripe caps. — Fields, fallow-ground. T. V. B. J. Z. S. 5
apétala L. 351.
- Ls glabr. or only faintly ciliate at the base. Seps applied to the caps. Pls more spreading and of a deeper green than the last; the 2 outer seps terminated by a distinct point which is gen. bent inwards when dry. S. *depressa* Schultz starg., *patula* Jord., *filicaulis* Jord., —As the last and often with it and (or) 350; Geneva, Cœuve, Bâle, Wilchingen. 5 . . . *ciliata* Fr. 352.
- 4 (1). Ls with long awn-like points, pubescent, as also the upper part of the stem, and the peduncles which are very long.—Veltlin; indicated in Misox. 7
subulata Presl. 353.
- Ls shortly mucronate **5**
5. Upper ls distinctly shorter, bearing in their axils clusters of small ls (stunted branches). Pets twice as long as the cal.—Turfy-land; here and there (wanting in G. S.). 7
nodosa Fenzl. 354.
- Upper ls not noticeable smaller **6**
6. Pets rather shorter than, or barely as long as the cal. Pl. glabr. Habit of S. *procumbens*, but fls 5-merous, peduncles longer, seps applied to the caps. &c. Sp. *macrocarpa* Maly.—Alp., subalp. and Jura. 6, 7
Linnæi Presl. 355.
- Pets $1\frac{1}{2}$ —2-times as long as the cal. Pl. pubescent with glandular hairs. S. *glabra* Koch. (nomen ineptum).—Alp.; St. Bernard. 7 *repens* Burnat. 356.

104. *Buffonia*. *Buffonia*. IV, 23.

1. Habit of *Juncus bufonius*. B. *macrosperma* Gay, B. *tenuifolia* Gaud. not L.—Gravelly places; W. (Charat, Ardon &c.). 7 *paniculata* Delarbr. 357.

105. *Alsine*. *Alsine*. X, 26, 29. VIII, 23.

1. Ls roundish, oval, oval-lanceolate or lanceolate . . . **2**
- Ls linear or subulate **6**

2. Pets and seps 4. Stas 8. Pl. forming a thick tuft. Ls obtuse, with us (b. Rionii Grml.—*A. herniarioides* Rion) ciliate.—High Alp.; W. (Ofenthal near Mattmark and Allalinhorn). 7, 8 **aretioides** M. K. 358.
- Pets and seps 5. Stas 10 **3**
3. Caps. 3-valved. Seed bordered by a crest of subulate warts. Pl. with creeping shoots. Seps acute, with several nerves.—Alp. rare; G. Simplon. 7 **lanceolata** M. K. 359.
- Caps. 6-valved **4**
4. Pets as long as, or longer than the cal. Comp. *Arenaria ciliata* and *biflora*.
- Pets distinctly shorter than the cal. **5**
5. Ls 12—18 mm long, petioled, the lower ones with the petiole about as long as the blade. Seed with an appendage. Genus *Mœhringia*.
- Ls 2—4 mm long, sessile or the lower ones contracted to a short petiole. Seed without appendage. Genus *Arenaria*.
- 6 (1). Pets gen. 0, rarely present and small, setaceous, green or white and almost as long as the cal. Pl. forming dense tufts. *Cherleria sedoides* L.—High Alp. 7
Cherléri Fenzl. 360.
- Pets always present **7**
7. Seps linear-oblong, rounded-obtuse. Pets twice as long as the cal. Type of *A. laricifolia* **8**
- Seps oval-lanceolate, lanceolate, or lanceo.—subulate, acute or acuminate, rarely oblong-linear, rather obtuse, but then the pets little longer than the cal. **9**
8. Cal. glandular, attenuated at the base into an enlargement of the petiole. Caps. a third longer than the cal. Seed $1\frac{1}{2}$ mm, bordered by a denticulate crest. Stem bearing 1—5 fls. *A. Bauhinorum* Gren.—Jura (Reculet, Dôle). 7 **liniflora** Heg. 361.
- Cal. not glandular, truncate at the base. Caps. as long as, or barely longer than the cal. Seeds smaller (scarcely 1 mm), with finely tubercled edges. Stem often paniced. *A. striata* Gren.—Alp.; almost the whole central chain. 7 **laricifolia** Crantz. 362.
9. Seps cartilaginous, white, marked on the back with 2 green stripes (sometimes almost confluent) **10**
- Seps green or only scarious at the edges **11**
10. Pets almost as long as the cal. Fls in a terminal corymb. Stems numerous, tufted. *A. rostrata* Koch.—Alp.; G. W. 7, 8 **mucronata** L. 363.
- Pets only $\frac{1}{3}$ the length of the cal. Fls in dense fascicles terminating the stem and the axillary branches which are shorter than the stem. Ann. pls. Stems solitary or not numerous, stiff. Seps more finely acuminate

- than in the last. *A. fasciculata* M. K.—Hills; W. V. J. 7
Jacquinii Koch. 364.
11. Pets decidedly shorter than the cal. (Pl. ann., branched, many-fld). Type of *A. tenuifolia* **12**
 — Pets about as long as the cal., or rather longer or shorter **13**
12. Seps oval-lanceolate, shorter than the capsule. Pls glabr. or with scattered glandular hairs, the branches diffuse, ascending.—b. *laxa* Jord. Southern form with finer and more spreading branches.—Fields of the Swiss plateau; fairly distrib. 6 **tenuifolia Crantz. 365.**
 — Seps lanceolate-subulate, more finely acuminate than in the last, longer than the caps. Pl. covered with a glandular pubescence, branching upwards from the base, with almost erect branches. *A. hybrida* Jord.?—As the last, on gravel and sand, rare; W. V. 5, 6
viscosa Schreb. 366.
13. Caps. 6-valved. Comp. *Mœhringia polygonoides* and *Arenaria grandiflora*.
 — Caps. 3-valved **14**
14. Ls nerveless or with 1 nerve. Pls glabr. or the peduncles alone pubescent **15**
 — Ls, at any rate in a dried state, distinctly 3-nerved. Pls more or less glandular-pubesc., at least in the upper portion. Type of *A. verna* **16**
15. Pedicels much elongated (15—35 mm), glabr., gen. 3—5. Habit of a *Sagina* but the caps. 3-valved.—Peat swamps of the Jura (Vaud, Neuchâtel). 7 **stricta Wahlb. 367.**
 — Pedicels short, 5 mm, pubescent, fls 1—2.—High Alp., very rare; G. W. V. (Val Muranza, Alesse, Paneyrossaz). 6
biflora Wahlb. 368.
16. Branches of the rt-stock almost woody, blackish. Ls narrow, linear, thick, gen. reflexed on one side. Outer seps 5—7-nerved; nerves less distinct than in the following. Stem gen. 1—3-fld.—High Alp. G. T. W. U. 7
recurva Wahlb. 369.
 — Branches of the rt-stock thinner, not woody. Ls linear-subulate, flat, gen. straight. Seps all 3-nerved, with well defined nerves. Stem 3—many-fld.—b. *alpina* (*A. Gerardi* Wahlb.). Pl. forming a dense tuft. Stem 1—3-fld.—c. *nivalis* Fenzl. (*A. sedoides* Frœl.). Pl. densely tufted, stem always 1-fld. Ls shorter, broader, glabr.—Alp. and subalp.; Reculet and Colombier in the Jura; c. *Lavirum*! 7
verna Bartl. 370.

106. *Mœhringia*. *Mœhringia*. X, 26. VIII, 23.

1. Ls petioled, oval or oval-oblong, with 3—5 nerves. Pets shorter than the cal.—Hedges, thickets; everywhere. 5
trinervia Clairv. 371.

- Ls not petioled, linear or linear-filiform, nerveless. Pets longer than the cal. 2
- 2. Seps acute, 4. Stas 8. Styles 2. Ls filiform. Peduncles 10—25 mm.—Rocky, shady places in the Alp., subalp. and Jura; extending to the foot of the mountains. 5, 6 **muscosa** L. 372.
- Seps obtuse, 5. Stas 10. Styles 3. Ls linear. Peduncles 5—8 mm. *M. sphagnoides* Richb. (dwarf form).—Alp. 7 **polygonoides** M. K. 373.

107. *Arenária*. Sandwort. X, 26.

- 1. Ls lanceolate-subulate, acuminate, with a stiff awn, with a strong nerve underneath, thickened at the edges (by the lateral nerves). Pets twice as long as the cal.—Jura (Chasseron, Suchet); Salève. 6, 7 **grandiflora** All. 374.
- Ls rounded, oval, or oblong-lanceolate, gen. with several nerves underneath 2
- 2. Pets rather longer than the cal. Perenn. pls 3
- Pets at least $\frac{1}{3}$ shorter than the cal. Ann. pls. Type of *A. serpyllifolia* 4
- 3. Ls almost orbicular, very obtuse, shortly petioled. Fl-stem short, 1—2-fld, rising from prostrate, stolon-like branches.—High Alp.; not common. 7 **biflora** L. 375.
- Ls oval-lanceolate or oblong-lanceolate, sub-acute, drawn into a short petiole, ciliate. Stem 1—many-fld.—b. *densior* (*A. multicaulis* Wulf.). Barren branches very numerous. Stem short 1—2-fld.—c. *laxior* (*A. gothica* Gren. an Fr.?). Barren branches rare, stem higher, several—many-fld.—Alp. and Jura; c. by the lac de Joux. 7 **ciliata** L. 376. *)
- 4. The scarious edge of the inner seps at most $\frac{1}{2}$ as broad as the central herbaceous part. Low-growing pls, yellowish green; with rather longer hairs than in the following, fls more crowded and seps more finely acuminate.—High Alp.; G. W. 7 **Marschlinii** Koch. 377.
- Scarious edge of the inner seps as broad as the central herbaceous part 5
- 5. Seps oval-lanceolate. Caps. ovoid, much swollen towards the base, bursting with a report when pressed. *A. sphærocarpa* Ten.—Fields, walls; everywhere. 5 **serpyllifolia** L. 378.
- Seps lanceolate, narrower than in the last. Caps. oval-oblong, bursting without noise when pressed. Pls more delicate in every respect than the last; fls smaller.—As the last and often accompanying it, especially in warm regions, but rarer . . . **leptoclados** Guss. 379.

*) The v. *laxior* = *A. gothica* Fr. According to Grenier (mém. soc. d'émul. Doubs 1873) and Vetter (oral communication) annual or annual and lasting the winter, and certainly a distinct species from *ciliata*.

108. **Holósteum. Holosteum.** V, 145. III, 82.

1. Pl. of a glaucous green, pubescent-glandular above.—Grassy places and walls in warm regions; G. W. V. J. Z. S. 4 **umbellatum L.** 380.

109. **Stellaria. Starwort.** X, 27. V, 145. III, 82.

1. Stem cylindric. Ls glabr., oblong-lanceolate, the lower ones narrowed towards the base. Comp. *Cerastium trigynum*.
 — Stem cylindric. Ls oval or cordate-oval, the lower ones petioled **2**
 — Stem 4-angled. Ls linear-lanceolate or oblong-lanceolate, all sessile **4**
2. Pets almost twice as long as the cal. Stem pubescent all round.—Damp places, shady spots, especially in the mount. and subalp. 6 **nemorum L.** 381.
 — Pets shorter, or barely as long as the cal., or 0. Stems with a line of hairs running up them. Type of *St. media* **3**
3. Pets shorter than the cal.—Road sides, walls, gardens; everywhere. 4—9 **média Cirill.** 382.
 — Pets 0. Pl. with many stems, pale green. Cauline ls often petioled. Peduncles villous all round. Styles very short. *St. Boræana* Jord.—As the last, but rarer. V. W. ? **pallida Piré,** 383.
- 4 (1). Bracts herbaceous. Pets divided to the middle. Ls linear-lanceolate, narrowed almost from the base in a straight line.—Hedges, thickets; rare; T. V. J. L. Z. 6 **Holóstea L.** 384.
 — Bracts scarious. Pets div. almost to the base **5**
5. Pets decidedly shorter than the cal. Ls oblong-lanceolate. *St. glacialis* Lagg. (form with small ls).—Damp woods, springs; distrib. (wanting in S.). 6 **uliginosa Murr.** 385.
 — Pets about as long as, or rather longer than, the cal. Ls linear or linear-lanceolate **6**
6. The angles of the upper parts of the stems and the edges of the ls scabrous, the effect of fine denticulation. Bracts glabr. at the edges.—Damp, wooded places; Engadine near Celerina and between Samaden and Bevers on the right hand bank of the Inn! 7 **Friesiana Ser.** 386.
 — Stems and ls glabr. **7**
7. Edges of the bracts glabr. Stem fairly erect. Ls gen. rather glaucous. *St. glauca* With.—Swampy meadows; Binningerried near Schaffh., still at Bienne in 1880. 6 **palustris Ehrh.** 387.

- Bracts ciliate at the edges. Stems spreading or (among herbs or bushes) erect. Ls grass-green. rarely glaucous. Hedges, plains; distrib. 6 . . . **graminea** L. 388.

110. **Cerastium. Cerast.** X, 27. V, 152. IV, 23.

1. Pets entire or slightly indented. Caps. shorter or scarcely longer than the cal. (Ann. pls, glaucous, entirely glabr.) *Moenchia* spec. auct. 2
- Pets more or less deeply 2-fid. Caps. gen. distinctly longer than the cal. Fls 5-merous 3
2. Fls 4-merous. Pets shorter than the cal. Stem 3—5 cm, 1—3-fld. *Moenchia erecta* Fl. Wett.—Arid places; Geneva. 5 **quaternellum** Fenzl. 389.
- Fls 5-merous. Pets almost twice as long as the cal. Stem 20—30 cm, 3—many-fld.—As the last; transalp. Switz. 6 **manticum** L. 390.
3. Styles 3 (rarely by anomaly 4 or 5). Ls glabr., linear-lanceolate. Bracts herbaceous. *Stellaria cerastoides* L. —Alp. 7 **trigynum** Vill. 391.
- Styles 5, pubescent or villous 4
4. Caps. ovoid, with valves united in pairs. Comp. genus *Malachium*.
- Caps. cylindric or cylindric-conic, with valves equally separated 5
5. Fls small. Pets shorter, or as long as or barely longer than the cal. (not more than 8 mm), rarely 0. Ann. or bienn. pls (only No. 394 lasting several years) 6
- Fls fairly large. Pets 1½—2 times as long as the cal. Perenn. pls producing numerous tufted barren shoots by the side of the fl.-stems 10
6. Bracts herbaceous up to the top and hairy, at most narrowly scarious and glabr. at the edges, the hairs reaching beyond the point. Pets or stas ciliate 7
- Bracts scarious and glabr. at the sides and top, the hairs of the back not reaching beyond the scarious top. Pets and stas glabr. 8
7. Fr.-pedicels as long as, or shorter than, the cal.! Pl. of a light green, with short hairs, with or without glandular hairs mixed with the others.—Fallow land, road sides; distrib. 5 **glomeratum** Thuill. 392.
- Fr.-pedicels 2—3 times as long as the cal. Pl. of a gray-green, rough with long hairs intermixed with (or rarely without) glandular hairs.—As the last, but less distrib. (wanting in G. T. U. L. A.). 5 **brachypetalum** Desp. 393.
8. Bienn. or perenn. pl. Stems 10—40 cm, gen. without glands, the lateral ones prostrate, rooting at the base. Fls larger than in the 2 last and the 2 following. Seed

- more distinctly granular.—Grassy places, road-sides; everywhere. 5—9 . . . **triviale** Link. 394.
- Ann. or bienn. pls. Stems 5—15 *cm*, never rooting, gen. glandular-viscous . . . **9**
9. Edges of all the bracts broadly ($\frac{1}{3}$ — $\frac{1}{2}$) scarious. Fr.-pedicels reflexed.—Grassy places, slopes; not everywhere (wanting in A. U.). 4 . . . **semidecandrum** L. 395.
- Lower bracts herbaceous, the edges not or scarcely scarious. Fr.-pedicels inclined or horizontal. *C. pumilum* Curt. ex Babgt.—As the last, but rarer; V. B. J. A. (?) Z. 4 . . . **glutinosum** Fr. 396.
- 10 (5). Bracts all entirely herbaceous, resembling the cauline ls. Seeds marginate. Type of *C. latifolium* . . . **11**
- Bracts with more or less scarious edges. Seed emarginate . . . **12**
11. Pets spreading in the form of a basin, more than twice as long as the cal. Caps. inflated at the base, rather curved. Seed 2—3 *mm*.—High Alp., apparently only on calc. 7, 8 . . . **latifolium** L. 397.
- Pets as in the last, but never more than twice as long as the cal. Caps. ovoid at the base, curved. Seed $1\frac{1}{2}$ —2 *mm*. Ls softer, pedicels longer than in the last *C. subacaule* Heg., *C. glaciale* Gaud.—High Alp., probably only on silicious soil; G. W. U. 7, earlier than the last **uniflorum** Murith. 398.
- Pets bell-shaped, less spreading than in the 2 last, exceeding the cal. by $\frac{1}{3}$ at most. Caps. almost cylindric, straight. Seed 1— $1\frac{1}{2}$ *mm*. Growth slenderer with narrower ls and longer pedicels. *C. pedunculatum* Gaud.—High Alp., especially in the neighbourhood of glaciers, sometimes by the side of *C. uniflorum*, only in the central Alps. 7. Earlier than *C. latifolium*. **filiforme** Schleich, 399.
12. Ls oblong, gen. without fascicles of small ls in their axils. Pets very spreading, straight. Stem 1—5-fld. Hair long, flexible.—b. *lanatum* Lam. Ls white-woolly.—High Alp., not common. 7 . . . **alpinum** L. 400.
- Ls linear or linear-lanceolate, gen. with fascicles of small ls in their axils. Pets spreading in the shape of a bell (curved outwards). Stem 5—15-fld . . . **13**
13. Pl. entirely white-tomentose.—Walls: Vevey! Bévioux! PonteTresa! (probably naturalised, widely distrib., however, in Italy). 6 . . . **† tomentosum** L. 401.
- Pl. not tomentose.—b. *strictum* Hünke. Pl. more glabr., forming denser tufts, the stems more erect.—c. *viscidulum* Grml. As b. but entirely glandular-viscous (Zermatt).—Road-sides, slopes; b. alpine form. c. Mattmark (Saas). 5—7 . . . **arvense** L. 402.

111. **Maláchium. Water-Starwort.** X, 27.

1. Ls cordate-oval. Easily distinguished from 381 by the 5 styles and the sessile upper caul. ls. *Stellaria pentagyna* Gaud.—Damp places, hedges, ditches; distrib. 6
aquaticum Fr. 403.

14. **Elatinaceæ.**

112. **Elátine. Elatine.** VIII, 23, VI, 33. III, 80.

1. Ls whorled, sessile. Stem 15—40 cm, erect in the land form.—Inundated places; formerly near Bâle, Constance. 8
* *Alsinastrum* L. 404.
- Ls opp., petioled. Stem 3—10 cm, prostrate . . . 2
2. Fls sessile, or very shortly pedicelled, 4-merous. Seed curved like a horse-shoe, with unequal sides.—As the last; Veltlin, Aostathal. 8 . . . * *Hydrópiper* L. 405.
- Fls pedicelled, 3-merous. Seed feebly curved. *E. paludosa* Seub. p.—Versoix, on the lake of Geneva. 9
hexandra Dec. 406.

15. **Lineæ.**

113. **Linum. Flax.** V, 149. XVI, 4.

1. Ls (at least some of them) opp., the lower ones obovate, the upper lanceolate. Pets white, yellowish at the base.—Fields, meadows; everywhere. 6 catharticum L. 407.
- Ls altern., linear or linear-lanceolate. Pets blue or lilac 2
2. Seps glandular-ciliate. Fls pale lilac.—Stony, sunny slopes; here and there (wanting in G. U. L. A.). 6
tenuifolium L. 408.
- Seps not glandular-ciliate. Fls blue . . . 3
3. Ann. pl.; stem solitary. Stig. clavate. Flax. Cultivated. 6
† usitatissimum L. 409.
- Perenn. pl. with several stems. Stig. capitate. *L. montanum* Schl.—Alp.; G. W. V. B. O. U. A.; Dôle and Mont Tendre in the Jura. 6, 7 . . . alpinum L. 410.

114. **Radiola. Allseed.** IV, 22.

1. Ls opp., oval. Pl. very small, branching in a corymb.—Damp, sandy places; formerly near Bâle. 7
* *linoides* Roth. 411.

16. Malvaceæ.

115. Malva. Mallow. XVI, 9.

1. Caul. ls gen. palmatipartite down to the base, with 5 inciso-dentate or 2-pinnatifid lobes (comp. 413) 2
- Caul. ls palmatifid with 5 (3—7) lobes 3
2. Leaflets of outer-cal. oblong-linear. Pl. with hairs, for the most part, simple and spreading.—Road-sides; here and there. 6 *moschata* L. 412.
- Leaflets of outer-cal. oval or oval-oblong. Pl. with short, stellate, applied hairs.—a. Caul. ls divided to the base. —b. *fastigiata* Cav. (Bismalva Bernh. Rechb.) Caul. ls div. barely to the middle into 5 lobes, the upper ones 3-fid, the middle lobe elongated. —As the last. 6 *Alcea* L. 413.
3. Leaflets of the outer-cal. oval-oblong Cor. of a violet-rose colour, with darker veins, 3—4 times as long as the cal.—Road-sides, rubbish heaps; distrib. 6 *sylvestris* L. 414.
- Leaflets of the outer-cal. linear-lanceolate. Cor. of a pale rose colour, about twice as long as the cal. *M. vulgaris* Fr.—As the last; everywhere. 6 *neglecta* Wallr. 415.

OBS. *M. mauritiana* L. (as in 414, but petals darker and less indented. Stem more upright, almost glabr.) and *M. crispa* L. (pedicels very short, ls crisp at the edges) are sometimes found escaped from gardens.

116. Althæa. Althæa. XVI, 9.

1. Fls shortly pedicelled, agglomerated. Perenn. pl., covered with a velvety pubescence.—Marshy places; rare and probably naturalised. 6 *officinalis* L. 416.
- Fls with fairly long pedicels, 1 or 2 together. Ann. pl., rough with stiff spreading hairs.—Fields, rare; W. V. and sometimes adventitious in other parts. 6 *hirsuta* L. 417.

OBS. *A. rosea* Cav. (March Mallow) is often cultivated in gardens.

17. Tiliaceæ.

117. Tilia. Lime. XIII, 9.

1. Fls with 5 staminodes or petaloid stas. Stas 50—70 2
- Fls without staminodes. Stas 20—40 3
2. Ls white-tomentose with stellate hairs underneath. Silver Lime.—Ornamental tree from Hungary. 7 † *tomentosa* Mönch. 418.
- Ls green underneath, almost glabr. (still larger than in 420). —Ornamental tree from America. 7 † *americana* L. 419.

- ## 18. Hypericaceæ.

*) **T. vulgaris Hayne** (intermedia Dec.) appears to be hybrid between 420 and 421; it is sometimes cultivated, but reported wild in Canton Vaud and near Weesen.

5. Prominent lines of the stem faint. Ls without transparent dots, or only the upper ones, rather narrowed to the base. Seps elliptic, obtuse, or the 2 inner ones narrower and rather acute. Pets gold-yellow, spotted with black.—Wood edges and cool places, especially in the mount.; not common. 7 . . . **quadrangulum** L. 426.
- Prominent lines of the stem almost winged. Ls half-clasping, with numerous transparent dots, but with the lateral nerves less anastomosed than in the last. Seps lanceolate, acuminate. Pets of a paler yellow and smaller than in the last, gen. not spotted.—Ditches; everywhere. 7 **tetrapterum** Fr. 427.
- 6 (3). Seps with fairly long glandular fringes, terminating almost in the shape of a club. Stem with 2 prominent lines in the upper part. Ls net-veined, without transparent dots.—Southern Jura (Chasseron to Reculet). 7 **Richeri** Vill. 428.
- Seps shortly ciliate-glandular. Stems cylindric. Ls, at least the upper ones, with transparent spots . . . 7
7. Seps obovate, very obtuse, bordered with almost sessile glands.—Woods, slopes, rare; almost exclusively in the northern parts of Switzerland. (Lenzburg, Baden, Rheinfelden, Feuerthalen, Wilchingen). 7 **pulchrum** L. 429.
- Seps lanceolate, acute, with stipitate glands . . . 8
8. Pl. glabr. Fls in a dense raceme.—Woods; distrib. 6 **montanum** L. 430.
- Pl. hairy. Inflorescence looser and with more numerous fls.—As the last. 6 . . . **hirsutum** L. 431.
- OBS. Hybrid: *H. quadrangulum-tetrapterum* (Wädenschwyl: Burnat.).

19. Acerineæ.

120. Acer. Maple. VIII, 9. XXII, 10.

1. Inflorescence forming a long pendant, rather branched, raceme. Ls grayish green underneath, dull. Sycamore Maple.—Mountain forests; distrib. 4 **Pseudoplatanus** L. 432.
- Inflorescence in a corymb or at last slightly elongated into a raceme 2
2. Ls thin, like paper, the lobes long acuminate, separated by rounded incisions, almost of the same colour all over and shiny underneath (resembling those of the Plane tree). Plane Maple.—As the last; rather earlier **platanoides** L. 433.
- Ls firmer, with obtuse, or at all events not long-acuminate, lobes 3

3. Ls 3-lobed, leathery, lobes almost entire. Fls appearing before the ls.—Thickets; Fort de l'Ecluse near Geneva. 4
 * **monspessulanum** L. 434.
- Ls 5-lobed (the 2 lower lobes sometimes only indicated). Fls at the same time or after the ls 4
4. Corymbs erect. Wings of the samara spreading almost horizontally. Common Maple.—Woods, thickets; distrib. 5
 campestre L. 435.
- Corymbs at last drooping. Wings of the samara parallel or only slightly divergent.—Mountain forests of southwestern Switz., especially in the Jura. 4
 opulifolium Vill. 436.

OBS. Of the family *Hippocastaneæ* are to be mentioned: 1) *Aesculus Hippocastaneum* L., Horse chestnut (Pets variegated with white, red, and yellow, with a short claw; fr. rough with stiff points). 2) *A. Pavia* L. (Pets with a long claw, red; fr. without stiff points); 3) *A. lutea* Wagh. (as the last but pets yellow), &c.

20. Ampelideæ.

121. Vitis. Vine. V, 7.

1. Ls 3—5-lobed, at last glabrescent. Fls, in the wild pl. (v. *sylvestris* Gmel.), imperfectly diœcious.—Cultivated and sometimes naturalised. 6 † **vinifera** L. 437.

OBS. *V. Labrusca* L. is cultivated in Tessin.—*Ampelopsis quinquefolia* R. Sch., an ornamental pl. originally from North America, with ls turning purple in autumn, is cultivated to ornament arbours and walls.

21. Geraniaceæ.

122. Geranium. Geranium. XVI, 10. X, 8.

1. Pets acute, or rounded, or truncate at the top 2
 — Pets distinctly indented or 2-fid 9
2. Pets unguiculate or long cuneiform narrowed at the base, glabr. Ann. pls with a fusiform root 3
 — Pets without, or with a short indistinct, claw, ciliate at the base. Perenn. pls with an oblique or horizontal rt-stock 5
3. Ls angular in contour, palmatisect with 1—2-pinnatifid segments, the middle segment petioluled! Seps awned.—Shady places, walls; everywhere. 5 **Robertianum** L. 438.
 — Fls smaller, anthers sulphur yellow (in the last brownish red before the pollen is shed); awns of the seps shorter. Pl. almost without any smell **purpureum** Vill. 438a.
 — Ls roundish in contour, palmatilobed or -fid; lobes not or scarcely reaching the centre, obtuse or truncate, shortly 2—3-fid towards the top. Seps acuminate 4

4. Seed smooth. Seps wrinkled transversely. Pl. almost glabr. —Rocky, shady places, rare; W. V. J. 5 *lucidum* L. 439.
- Seed reticulate-alveolar (*G. molle* and *G. pusillum* have smooth seeds and pets distinctly indented). Seps not wrinkled transversely. Pl. soft pubescent.—Stony places, road-sides; not everywhere (wanting in *G. U. L. A.*). 4 *rotundifolium* L. 440.
- 5 (2). Seps acuminate. Valves of the fr. with 2—3 deep wrinkles at the top. Seed smooth. Ls all altern. a. *fuscum* L. Fls dark violet.—b. *lividum* L'Hérit. Fls dirty lilac.—Thickets, meadows; not common and almost only in western Switz. 5, 6 *phæum* L. 441.
- Seps awned. Fr.-valves not wrinkled. Seed finely dotted. Most of the ls opp. 6
6. Stems spreading, with reflexed, glandless hairs towards the top. Fls purple. Fr.-pedicels bent backwards, as also the cal.—Marshy places, hedges, ditches; distrib. 7 *palustre* L. 442.
- Stems erect, with hairs (gen. glandular) towards the top 7
7. Pets white, veined with red. Fr.-pedicels erect, not glandular. Ls palmatipartite. *G. aconitifolium* L'Hérit. —Granite Alp.; *G. W.* (Engadine; Nicholaithal, Einfischthal, Bagnethal, St. Bernard). 7 . . . *rivulare* Vill. 443.
- Pets violet-red, or blue. Pedicels glandular . . . 8
8. Fr.-pedicels erect, as also the cal. Ls palmatifid.—b. *brachystemon* Godet. Pets shorter. Anthers yellow.—Mountain fields; distrib. 6 *sylvaticum* L. 444.
- Fr.-pedicels reflexed, with the cal. bent downwards, finally erect. Ls palmatipartite,—Fertile fields; S. (in many localities!), 5, flowers a second time in autumn *pratense* L. 445.
- 9 (1). Ls div. to, or almost to, the base. (Seps awned) 10
- Ls not div., or scarcely to the middle 12
10. Pedicels 1-fld! Pets 20 mm long. Seed finely dotted. Pl. rough with long, spreading, glandless hairs.—Sunny, stony slopes; distrib. 6 *sanguineum* L. 446.
- Pedicels (as in all the other species) 2-fld (only exceptionally 1- or 3-fld). Pets 5—10 mm long. Seed reticulate-alveolar! 11
11. Pedicels slender, longer than the ls. Fr.-beak glabr. or with glandless hairs pointing forwards. Stem with applied hairs, pointing downwards.—Fields, rubbish-heaps; distrib. 6 *columbinum* L. 447.
- Pedicels shorter than the ls. Fr.-beak glabr. or with spreading glandular hairs. Stem covered with short spreading hairs.—As the last. 6 *dissectum* L. 448.

- 12 (9). Ls angular in contour; segments almost rhomboidal, prolonged at the tip. Fr.-valves hairy . . . **13**
 — Ls roundish in contour; segments obovate, obtuse or truncate, shortly 3—5-fid at the tip. (Seps shortly acuminate. Seed smooth) . . . **15**
13. Fr.-valves wrinkled transversely. Fr.-pedicels reflexed. Seed smooth. Seps moderately acuminate. Fls small. Segments of the ls divergent.—Thickets, road-sides; G. W. (between Crusch and Remüs; Naters, Simplon, Visperthäler, Vercorin, Hermance). 6 **divaricatum** L. 449.
 — Fr.-valves smooth, or in 450 with a feeble transverse wrinkle at the top. Fr.-pedicels almost erect. Seed finely dotted. Seps long-awned . . . **14**
14. Leaf-segments oval, acuminate, unequally and coarsely toothed (not incised). Pl. perenn., finely pubescent. Pets of a light rose colour, 18—20 mm.—Woods; Lugano, Orsières, Voiron, Dessenberg. 6 . . . **nodosum** L. 450.
 — Leaf-segments 3-fid and inciso-dentate. Pl. bienn., with long spreading and glandular hairs. Pets 9—10 mm, ciliate, violet-blue.—Mountain woods, especially in neighbourhoods where charcoal is burnt; Lens, Joux-brûlée, Alp. de Morcles, Pencec in the Einfischthal. 7
 . . . **bohémicum** L. 451.
- 15 (12). Fr.-valves wrinkled transversely, glabr. Most of the ls altern. Fls purple, smaller than in *G. pyrenaicum*, larger than in *G. pusillum*; distinguished from the last also by its long-haired stems. Comp. 440.—Road-sides; rubbish-heaps; distrib. 5 . . . **molle** L. 452.
 — Fr.-valves (when fresh) not wrinkled transversely, gen. hairy. Most of the ls opp. . . . **16**
16. Pets 8—10 mm long, violet-red, with a small tuft above the claw. Stem pubescent and at the same time villous. Pl. perenn. (with the remnants of last year's ls at the base).—Road-sides, railway embankments; fairly distrib. 5
 . . . **pyrenaicum** L. 453.
 — Pets 4—5 mm long, violet-blue, with a finely ciliate claw. Stem covered with an extremely short pubescence (almost velvety). Pl. ann. Comp. 440 and 452.—Road-sides, rubbish-heaps; distrib. 5 . . . **pusillum** L. 454.

123. *Erodium*. *Erodium*. XVI, 10. X, 8.

1. Leaf-segments more or less closely set, sessile, gen. pinnatifid almost to the middle nerve, gen. with inciso-dentate lobes.—b. *chærophyllum* Dec. L.-segments and their lobes more distant, the latter more acute; pets not dotted.—Fields, road-sides, rubbish-heaps; distrib. 4
 . . . **cicutarium** L'Hérit. 455.

- Leaf-segments rather loosely set, often shortly petioluled, only inciso-dentate. Pl. more robust than the last, smelling of musk, often covered with glandular hairs. Stipules broader.—As the last; but rare and variable. 5
† *moschatum* L'Hérit. 456.

† moschatum L'Hérit. 456.

22. Balsamineæ.

124. **Impatiens. Touch-me-not.** V, 12.

1. Fls suspended, large, with a curved spur.—Damp, shady places; distrib. 6, 7 . . . **noli tângere L. 457.**
— Fls erect, smaller than in the last, with a straight spur.
—Road-sides, rubbish-heaps; naturalised near Rolle, Geneva, Weissenburg Canton Bern, Solothurn, Glarus, Zürich. 6, 7 *** parviflora Dec. 458.**

23. Oxalideæ.

125. **Oxalis.** **Oxalis.** XVI, 7. X, 13.

1. Peduncles radical. Pets white, veined with rose, with a spot of yellow at the base, more rarely entirely rose-coloured.—Cool, shady places; distrib. 4 **Acetosella** L. 459.
— Peduncles springing from the leaf-axils, 2—5-fld. Pets yellow 2
2. Ls exstip. Pedicels erect-spreading after the time of flowering. Stem gen. solitary, almost erect, with subterranean, rather fleshy stolons.—Cultivated places; naturalised. 6 **stricta** L. 460.
— Ls with very small stipules. Pedicels bent back after the flowering, with erect fr. Stems several, spreading, rooting, but without subterranean stolons.—As the last; Tess. otherwise sometimes adventitious. 6
corniculata L. 461.

24. Rutaceæ.

126. Ruta. Rue. VIII, 1. X, 9.

1. Fls yellow. Ls 2—3-pinnatifid. *R. graveolens* auct.
—Rocky places; T. W. Grandson, Neuchâtel. 6
hortensis Mill. 462.

127. Dictamnus. Fraxinella. X, 9.

1. Fls rose-coloured. Ls imparipinnate, resembling those of the ash.—Stony mountain slopes; T. W. S. 5, 6
albus L. 463.

25. Celastraceæ.

128. *Staphyléa*. Bladdernut. V, 137.

1. Ls pinnate, with 5—7 opp., toothed leaflets. Fls white, in pendant racemes.—Thickety hills; not common and in part only escaped from cultivation. 5 *pinnata* L. 464.

129. *Evónymus*. Spindle-tree. VI, 8. V, 8.

1. Branches 4-angular. Pets oblong, gen. 4.—Woods, hedges; everywhere. 4 *europæus* L. 465.
- Branches cylindric, rather compressed. Pets roundish, gen. 5.—As the last; T. O. U. L. Z. A. 5
latifolius Scop. 466.

26. Rhamnaceæ.

130. *Rhamnus*. Buckthorn. IV, 8. V, 11. XXII, 13.

1. Ls (of the present year's branches) more or less opp.
Twigs terminating in a spine 2
- Ls altern. Twigs not terminating in a spine 3
2. Petioles 2—3 times as long as the (decid.) stipules. Ls oval or elliptic, the base rounded or slightly cordate.
—Stony, wooded places; distrib. 5 *cathártica* L. 467.
- Petioles as long as, or only slightly longer than, the stipules. Ls elliptic-lanceolate, narrowed at the base.—Stony calc. hills; rare; G. T. Zürich. S. 4, 5
saxátilis L. 468.
3. Ls with about 9—15 almost straight lateral nerves on each side of the middle nerve. An erect shrub.—Sunny, rocky slopes of the Alp. and Jura, up to the foot of the mount.; (wanting in G. A.). 5, 6 *alpina* L. 469.
- Ls with 4—6 slightly curved lateral nerves on each side of the middle nerve. Small shrubs with branches closely applied to the rocks.—Rocky places of the Alp. and subalp. on calc.; Jura (Mont d'Or). 6 *púmila* Turr. 470.

131. *Frangula*. Alder Buckthorn. V, 11.

1. Twigs not spiny, dotted with white. Ls elliptic, entire. *Rhamnus Frangula* L.—Hedges, thickets; distrib. 5
Alnus Mill. 471.

132. *Zízyphus*. *Zízyphus*. V, 10.

1. Fls almost sessile. *Z. sativa* Gärt. —Thickets; T. W., escaped from cultivation. 6 † *vulgaris* Lam. 472.

133. *Paliurus*. *Paliurus*. V, 10.

1. Fls peduncled.—Hedges; T. escaped from gardens. 6
 † *australis* Gärtn. 473.

27. Terebinthaceæ.

134. *Rhus*. *Sumach*. V, 137.

1. Ls obovate, obtuse, entire. Venus's sumach.—Hills; T.
 W. (Lugano; Leuk, Martigny). 6 . . . *Cótinus* L. 474.

OBS. *Rh. Toxicodendron* L., *Rh. typhina* L. &c. are also found in
 shrubberies.

28. Papilionaceæ.

135. *Ulex*. *Furze*. XVI, 14.

1. Ls simple. Very spiny shrubs, bearing some resemblance
 to the Juniper tree. Fls yellow.—Very rare, certainly
 spontaneous near San Bernardo (Tess.). 5
europæus L. 475.

126. *Sarothamnus*. *Sarothamnus*. XVI, 15.

1. Ls partly ternate, partly simple. Fls yellow.—Wooded
 hills; transalp. Switz., rare on this side of the Alps.
 W. V. B. J. L. U. A. 5 . . . *scoparius* Koch. 476.

137. *Genista*. *Genista*. XVI, 16.

1. Stem creeping; branches with foliaceous wings.
 —Hills, wood-sides; in particular parts (wanting in G.
 T. U. L. A.). 5 . . . *sagittalis* L. 477.
 — Stem not creeping; branches not winged . . . 2
 2. Upper cal.-lip with 2 short teeth. Pedicels about 3 times
 as long as the cal. G. Halleri Reyn.—Jura (Vaud, Neu-
 châtel). 6 . . . *decumbens* Ait. 478.
 — Upper cal.-lip div. almost to the base . . . 3
 3. Stem spiny, leafless at the base.—Wood-sides; not every-
 where (wanting in U. L. A.). 6 . . . *germanica* L. 479.
 — Stem not spiny . . . 4
 4. Standard and keel silky.—Jura (from Geneva to Bâle). 5
pilosa L. 480.
 — Pets glabr. Type of *G. tinctoria* . . . 5
 5. Pods glabr., rarely covered with applied or villous hairs.
 Ls lanceolate or elliptic-lanceolate.—a. Stem and ls
 covered with applied hairs. Pods glabr.—b. *lasiogyna*
Grml. The same characters but pods covered with ap-
 plied hairs.—c. *Marii Favrat* (insubrica Brüggl!) As the

form a., but ls narrower, racemes slighter and fls smaller.
 d. *mantica* Poll. (Perreymondi Lois.) Stems and ls with spreading hairs. Pods villous.—Wooded hills; a. distrib.
 b. between Vernayaz and Salvan; c. and d. Tess. 6

tinctória L. 481.

- Pods villous. Stems and ls covered with short, spreading hairs. Ls broader than in the last, racemes shorter, often simple.—S. (Wangenthal). 6 . . . *ovata* W. K. 482.

138. *Cytisus*. Broom. XVI, 16.

1. Ls opp.; leaflets linear, decid.—Hills; central Wallis from the Sionne to Lens. 6 . . . *radiatus* Koch. 483.
- Ls alternate 2
2. Cal.-tube long (the lips shorter than the tube) . . . 3
- Cal.-tube short 4
3. Fls only lateral, the herbaceous branches always without late terminal fls.—Hills; T. (S. Salvatore and between Ascona and Ronco). 5, 6 . . . *hirsutus* L. 484.
- The later fls, at any rate, in an umbellate head, terminating the new, herbaceous branches. *C. prostratus* Koch (the first fls in a lateral raceme). *C. capitatus* Koch (lateral fls 0). - Hills; T. 5 (lateral fls), 6, 7 (terminal fls) *capitatus* Grab. 485.
4. Fls in lateral fascicles, with long pedicels.—T. (Calbege). 5 *glabrescens* Sart. 486.
- Fls in leafless racemes 5
5. Racemes erect, or only slightly inclined. Shrubs attaining as much as 1 m in height.—v. *nana* Favrat in. ! only half a foot high, racemes shorter, more stunted, leaflets more acute (Tess.);—Stony wooded slopes; G. T. W. Z. S. (southern and northern Switz.). 6 *nigricans* L. 487.
- Racemes drooping. Trees or large shrubs 6
6. Pods (ovaries) silky. Leaflets covered with applied hairs.—Mountain woods; Tess.; Salève, Reculet; ornamental trees. 5, 6 *Laburnum* L. 488.
- Pods (ovaries) glabr. Leaflet hairy only at the edges. Racemes longer. Fls smaller and of a darker yellow than in the last.—Mountain woods; G. T. W. V. B. O. rather later than the last . . . *alpinus* Mill. 489

OBS. *C. sessilifolius* L. only in shrubberies.

139. *Ononis*. Rest-harrow. XVI, 13.

1. Fls solitary (rarely 2 together) close in the leaf-axils. Pods erect, oval, not or only slightly longer than the cal. 2
- Fls 1—3 together on a common peduncle which is longer than a leaf. Pods pendant, oblong-linear, much longer than the cal. 4

- Fls variegated with dirty yellow, green and violet, also copper-coloured. Pods with $1\frac{1}{2}$ —2 turns. *M. media* Pers., *falcata-sativa*.—As the last and common in particular places. 6 * *vária* Mart. 499.
- 3. Peduncles many-fld, fls forming a head. Pods without prickles, with one turn at the top.—Fields, road-sides; everywhere. 5 Lupulina L. 500.
- Peduncles 2—7-fld. Pods prickly, with 2—5 turns 4
- 4. Common peduncle $\frac{1}{2}$ — $\frac{1}{3}$ the length of a leaf, with jointed hairs. Leaflets marked with a brown spot—Aigle, Lausanne (adventitious), Zofingen. 5 * *maculáta* Willd. 501.
- Common peduncle about as long as a leaf . . . 5
- 5 Stipules entire or with short teeth. Pods gen. with 5 turns. Pl. pubescent or gray-tomentose (v. *mollissima* Spr.)—Sunny places, hills; G. W. V. J. Z. A. S. 5 * *minima* Bartal. 502.
- Stipules deeply pinnatifid. Pod with 2—3 ($1\frac{1}{2}$ — $3\frac{1}{2}$) turns. Pls more or less glabr. Type of *M. hispida* Gärtn. (Urb.) . . . 6
- 6. Fr.-spines fairly straight, shorter than half the diameter of the pod.—Among corn, road-sides, adventitious and variable; Osterfingen, Hinweil, Montreux, Aigle, Bex. 6 * *apiculata* Willd. 503.
- Fr.-spines hooked at the top, as long as half the diameter of the pod.—As the last; Schaffh. Aarburg, Aigle, Zofingen. 6 * *denticulata* Willd. 504.

142. *Trigonella*. *Trigonel*. XVII, 9.

- 1. Fls yellow, in few-fld, almost sessile umbels. Pods veined transversely, with a short beak. Resembling 502.—Dry hills; W. (Branson, Iserabloz, Sion, St. Nicolas). 5 * *monspeliaca* L. 505.
- Fls blue, in many-fld racemes with long peduncles. Pods veined longitudinally, with a long beak. Resembling 497. *Melilotus coerulea* Lam.—Cultivated in some parts (Glarus, March) for use in the making of green cheese (Schabzieger). 6 † *coerulea* Ser. 506.

143. *Melilotus*. *Melilot*. XVII, 9.

- 1. Fls white.—Road-sides, river-sides; almost everywhere. 7 * *alba* Desr. 507.
- Fls yellow 2
- 2. Racemes dense, short. Fls very small (2 — $2\frac{1}{2}$ mm). Pods almost globular, obtuse. Stems 1—3 dm.—Vevey, Geneva, Neuchâtel. 6 * *parviflora* Desf. 508.
- Racemes at last elongated, lax. Fls rather larger. Pods oval, pointed 3

- 10 (6). Upper ls altern. Ann. pl. Fls of a dark blood-red, rarely (*b. Molinerii* Balb.) of a more or less pinky-white.—Cultivated and sometimes subspontaneous. 6
† *incarnátum* L. 518.
- Upper ls opp. Perenn. pls (except 522) . . . 11
11. Cal.-teeth almost equal. Fls white . . . 17
- Cal.-teeth unequal . . . 12
- 12 Fls yellowish-white. Cal.-teeth lanceolate-subulate, the lower (odd) one bent back at maturity.—Pasturages; here and there (wanting in G. T.). 6 *ochroleucum* L. 519.
- Fls rose-coloured, rarely varied to white or dirty white. Cal.-teeth filiform, or subulate-filiform, erect . . . 13
13. Cal.-tube glabr. Stipules lanceolate, narrowed insensibly to a point, more herbaceous than in *T. pratense*.—Hills; wood-sides; distrib. 6 . . . *medium* L. 520.
- Cal.-tube hairy . . . 14
14. Leaflets narrow, oblong-lanceolate, distinctly denticulate. Stipules lanceolate-subulate, narrowed insensibly. Pl. without a central rosette, with a central stem.—Hills; here and there (wanting in U. L.). 6 *alpestre* L. 521.
- Leaflets broader, oval or rhomboidal-oval, with entire or indistinctly denticulate edge. Stipules demi-oval, suddenly narrowed to an awn. Pl. with a central rosette and lateral stems.—*b. pedunculatum* Ser. (*sativum* Rchb.?) Heads with fairly long peduncles (without invols); fls paler; rad. ls gen. withered. (Vevey!)—*c. nivale* Sieb. Alpine form with thicker, dirty white or rose-coloured heads.—Plains, pasturages; everywhere, also cultivated. 5
pratense L. 522.
- 15 (2). Heads few-fl'd, lower tooth of the cal. distinctly longer than the others. Fls very large, about 20 mm long, rose-coloured, very rarely yellowish-white.—Alp. 6
alpinum L. 523.
- Heads many-fl'd. Cal.-teeth of equal length or the 2 upper ones longer . . . 16
16. Pedicels not deflexed after flowering (except sometimes the lower ones). Common peduncles rising from the root-stock. *T. cæspitosum* Reyn.—Alp. and Jura (Dôle, Marchairuz, and Mont Tendre). 7 . . . *Thalii* Vill. 524.
- Pedicels deflexed after flowering . . . 17
17. Cal.-teeth of equal length. Leaflets hairy underneath, closely nerved at the edge.—Pasturages, especially of the mountains; distrib. 6 . . . *montánum* L. 525.
- Cal.-teeth unequal, the 2 upper ones longer. Leaflets gen. glabr. . . . 18
18. The 2 upper cal.-teeth contiguous, separated by an acute sinus which is not so deep as the others . . . 19

- The 2 upper cal.-teeth diverging from the base, separated by a rounded sinus which is as deep or deeper than the others. Type of *T. hybridum* 20
- 19. Stems prostrate and rooting. Fls white or slightly tinged with rose.—Grassy places, road-sides; everywhere. 5
repens L. 526.
- Stems prostrate but not rooting. Fls of a yellowish-white. *T. glareosum* Schleich?—Granite Alp., fairly rare; G. T. W. O. 7 *pallescens* Schreb. 527.
- 20. Fls at first white, changing to rose. Stems erect or ascending, hollow.—Damp meadows, water-side, rare; T. W.? V. B. J. S. A.; also sometimes adventitious. 6
hybridum L. 528.
- Fls rose-coloured from the first, rarely white or yellowish-white. Stems prostrate or ascending, not or scarcely hollow. Heads smaller than in the last.—Pasturages, road-sides, ornamental fields, rare and gen. adventitious; See N. Beitr. II. 4, 7. T. V. B. J. Z. S. A.
elegans Sav. 529.
- 21 (1). Upper ls almost opp. Axillary heads gen. only 1—3
22
- Ls all altern. Axillary heads several 23
- 22. Heads at last long-cylindric. Fls turning to a deep chestnut-brown.—Alp. W. V. 7 . . . *spadiceum* L. 530.
- Heads at last ovoid-globular. Fls turning light brown.—Alp., subalp. and Jura. 6 . . . *badium* Schreb. 531.
- 23. Heads composed of 5—15 fls 24
- Heads composed of 20—50 fls 25
- 24. Fls pale-yellow. Standard almost smooth. Style about $\frac{1}{4}$ the length of the pod. *T. filiforme* Koch.—Meadows, grassy places; distrib: 5 . . . *minus* Relh. 532.
- Fls golden yellow. Standard furrowed. Style about as long as the pod.—Pasturages of Italian Switz. 6
patens Schreb. 533.
- 25 Stipules demi-oval, broader at the base. The middle leaflet with a distinctly longer petiole than the 2 lateral ones. *T. procumbens* Koch.—a. *majus*. Heads larger with a common peduncle as long as, or only slightly longer than the ls.—b. *minus*. *T. Schreberi* Jord.). Heads smaller with fls of a paler yellow; common peduncle as much as twice the length of the ls.—Fields, especially after mowing (a); road-sides and grassy places (b); distrib. 5—8
campestre Schreb. 534.
- Stipules oblong-lanceolate, not enlarged at the base. Leaflets almost equally shortly petioluled. *T. agrarium* Koch.—Wood clearings; distrib. but not common. 6
aureum Poll. 535.

145. **Dorycnium. Dorycnium.** XVII, 6.

1. Stems suffrutescent. Leaflets linear-cuneiform.—Hills, only near Chur. 6 . . . **suffruticosum** Vill. 536.
- Stems herbaceous. Leaflets oblong-cuneiform, almost twice as broad as in the last.—Tess. (Lugano, Meride). 6
herbaceum Vill. 537.

146. **Lotus. Lotus.** XVII, 5.

1. Cal.-teeth reflexed before flowering. Umbels 6—15-fl'd. Stem cylindric, with a wide hollow.—Marshy places; distrib. 7 . . . **uliginosus** Schk. 538.
- Cal.-teeth connivent before flowering. Umbels 2—6-fl'd. Stem angular, solid or with a narrow hollow . . . 2
2. Leaflets obliquely obovate, or oblong-obovate. b. *pilosus* (villosus auct. not Thuill.). Pl. more erect, villous.—Pasturages, road-sides; everywhere; b. W. T. V. 5
corniculatus L. 539.
- Leaflets oblong-linear or linear, rather thicker than in the last; stems slenderer.—Damp, grassy places, water-side, rare. T. W. V. J. 6 . . . **tenuis** L. 540.

147. **Tetragonolobus. Tetragonolobus.** XVII, 5.

1. Fls sulphur yellow, solitary, with long peduncles.—Damp meadows; distrib. 6 . . . **siliquosus** Roth. 541.

147*. **Glycyrrhiza. Glycyrrhiza.** XVII, 16a.

1. Fls lilac. Leaflets 11—17, viscous underneath.—The hill Valeria near Sion (already in Heg. Beitr., recently found again). 6 . . . † **glabra** L. 542.

148. **Colútea. Bladder Senna.** XVII, 14.

1. Fls yellow. Pods closed at the top.—Hills; G. W. V. Neuchâtel, Uri (Axen), A. (Gonzen district). 5.—The *C. orientalis* Mill. (cruenta Ait.) which resembles it, has pods open at the top, and is cultivated in shrubberies
arborescens L. 543.

149. **Robinia. Robinia.** XVII, 14.

1. Fls white.—Cultivated and propagating itself spontaneously by subterranean runners, but not by seeds. 6.—*R. glutinosa* Sims. and *R. hispida* L. are also found in shrubberies, both having rose-coloured fls **Pseudacácia** L. 544.

150. **Phaca. Phaca.** XVII, 18.

1. Ls with 9—11 pairs of leaflets. Stipules linear-lanceolate. Stem branched, 30—45 cm long.—Alp. 7
alpina Wulf. 545.

- Ls with 4—5 pairs of leaflets. Stipules oval, foliaceous
Stem simple, 20—30 cm.—Alp. 7 . . . *frigida* L. 546.

151. *Oxytropis*. *Oxytrope*. XVII, 17.

1. Pods 2-celled, *i. e.* the two sutures bent inwards so as to form a complete septum. Fls violet. Stemless pls, villous-silky, or (*b. velutina* Sieb.) villous-wooly or (*c. intricans* Thom.) more sparsely hairy or nearly glabr.—Alp., rare; variety *b.* in Wall. also in the valley (Saxon, &c.); *c.* Lower-Engadine, Münsterthal, Pilatus. 4—6
Halléri Bunge. 547.
- Pods 2-celled. Fls yellowish. Stem 20—40 cm, erect.—Stony places; G. T. W. St. Gallen, Hohentwiel. 5
pilosa Dec. 548.
- Pods half 2-celled, the upper suture only inflexed 2
2. Pods sessile (in the cal.). Stemless pls . . . 3
- Pods stipitate. Stem present but sometimes short, or indeed 0. (Fls violet or blue) . . . 4
3. Pl. with glandular hairs, Fls yellowish-white.—High Alp.; W. (southern chain). 6 . . . **foetida Dec. 549.**
- Pls without glandular hairs. Fls yellowish, rarely partly or entirely violet (*b. sordida* Gaud.). Alp. 6
campestris Dec. 550.
4. Carpophore (stalk of the pod) as long as the cal.-tube. Cal.-teeth only attaining $\frac{1}{4}$ or at most $\frac{1}{3}$ the length of the cal.-tube. O. Jacquini Bunge.—*b. sericea* (montana Dec.). Ls almost gray-silky.—Alp. and Jura (Reculet, Colombier). 7 . . . **montana Dec. 551.**
- Carpophore only $\frac{1}{2}$ the length of the cal.-tube. Cal.-teeth as long or almost as long as the tube . . . 5
5. Pods erect. Resembling the last, but the pl. gen. stemless, gray-silky all over, keel with a longer point. O. cyanea auct. not Bieb. O. Gaudini Bunge.—Alp. W. (Nicolaithal and Bagnethal). 7 . . . **neglecta Gay. 552.**
- Pods pendant. Distinguished also from O. montana by the longer cal.-teeth.—Alp.; G. W. (Albula, Simplon; Saas, val du Dix, Bagne, St. Bernard). O. (Faulhorn). 7
lapponica Gay.*) 553.

152. *Astrágalus*. *Milk-Vetch*. XVII, 18.

1. Wings deeply incised or 2-fid. Ls with 4—8 pairs of leaflets. Fls variegated with white and violet. Phaca australis L.—Alp. 7 . . . **australis Peterm. 554.**
- Wings undiv., obtuse 2

*) The plant of Mt. Generoso appears to be allied to *O. corinthiaca* Fisch.—Oost. See N. Beitr. III, 7.

2. Ls paripinnate, the petiole terminated by a spine instead of a terminal leaflet.—Alp. and subalp.; W. V. B. 5, 6
aristatus L'Hérit. 555.
- Ls imparipinnate, not spiny 3
3. Stipules united to the petiole almost to the middle. (Pls almost or entirely stemless) 4
- Stipules entirely free, or united to the petiole only by their base 5
4. Fls yellow, clustered on the rt-stock.—Subalp. W. 5
exscapus L. 556.
- Fls red with peduncles at least as long as the ls.—Gravelly places; G. T. W. V. 5 **monspessulanum L. 557.**
5. Keel about as long as the standard. Ls with 7—11 pairs of leaflets. Fls variegated with white and violet. Pods pendant. Phaca astragalina Dec.—Alp. 7 **alpinus L. 558.**
- Keel at least $\frac{1}{3}$ shorter than the standard 6
6. Fls red, blue or violet 7
- Fls yellow or yellowish-white 8
7. Standard $\frac{1}{3}$ or $\frac{1}{4}$ longer than the wings. Ls with 6—10 pairs of leaflets.—Alp.; W. 6 . . . **leontinus Wulf. 559.**
- Standard narrower than in the last, twice as long as the wings. Ls with 8—12 pairs of leaflets.—Grassy places; T. G. W. 5 **Onóbrychis L. 560.**
8. Stem 0, or very short. Terminal leaflet very shortly, and not longer petioluled than the others.—Alp.; T. W. V. B. O. 5, 6 **depressus L. 561.**
- Stem 3—15 dm. Term. leaflet with a long petioluled, distinctly longer than the others 9
9. Ls with 5—6 pairs of leaflets. Pods 3-cornered, linear, glabr. Pl. almost glabr., 50—100 cm.—Wood-sides, thickets; distrib. 6 **glycyphyllus L. 562.**
- Ls with 8—12 pairs of leaflets. Pods almost globular, rough. Pl. with applied pubescence, 40—60 cm.—Grassy hills; rare; G. W. V. B. J. S. 6 . . . **Cicer L. 563.**

153. **Coronilla. Coronilla. XVII, 12.**

1. Fls variegated with red and white; keel gen. with a blackish-violet tip. Ls with 6—12 pairs of leaflets.—Pasturages, wood-sides, gen. not uncommon (wanting in A.). 6
vária L. 564.
- Fls yellow. Ls with 3—7 pairs of leaflets 2
2. Claws of the pets 2—3 times as long as the cal., pets therefore appearing stipitate. Ls with 2—4 pairs of leaflets. Shrubs of 100—150 cm.—Stony, wooded slopes; fairly distrib. 4, 5 **Emerus L. 565.**
- Claws of pets only about as long as the cal. Ls with 3—7 pairs of leaflets. Stems herbaceous or suffrutescent, 20—60 cm 3

3. Pedicels 3 times as long as the cal.-tube. Umbels 15—30-fld.—As the last; almost throughout the whole Jura; Graub. 6 **montána Scop.** 566.
- Pedicels as long or slightly longer than the cal.-tube. Umbels 5—15-fld. **4**
4. Stipules almost as large as the leaflets; the lowest pair of leaflets far from the stem. Differing from 570 in the shorter claws of the pets, shorter cal.-teeth, and leaflets rather thicker, glaucous, with white edges.—Rocky places of the Alp., subalp. and Jura, on limestone. 5, 6
vaginális Lam. 567.
- Stipules much smaller than the leaflets, the lower pair of leaflets close to the stem. As the last; W. (Pfynwald, Nioux, Varen). 5 **minima L.** 568.

154. **Ornithopus. Bird's-foot.** XVII, 11.

1. Fls small, whitish, the standard streaked with red. Ls with 7—12 pairs of leaflets.—Dry pasturages; Reiden, Canton Lucerne, formerly also near Bâle. 5
perpusillus L. 569.

155. **Hippocrépis. Horse-shoe-Vetch.** XVII, 12.

1. Fls yellow, Pets unguiculate. Ls with 5—8 pairs of leaflets.—Dry sunny places; distrib. 5 **comosa L.** 570.

156. **Hedysarum. Hedysarum.** XVII, 16.

1. Fls red. Pods pendant. Ls with 5—9 pairs of leaflets. Alp. 7 **obscurum L.** 571.

157. **Onóbrychis. Sainfoin.** XVII, 15.

1. The middle teeth of the lower, keeled, edge of the pod as long as the breadth of the keel. Stem prostrate. O. Gaudini Jord.—Sandy hills; W. T. ? 6 **arenária Dec.** 572.
- The teeth of the lower, keeled, edge of the pod half as long as the breadth of the keel **2**
2. Stems erect or ascending, 20—60 cm. Leaflets linear-oblong. O. sativa Lam.—Dry hills, pasturages; also cultivated. 5 **viciæfolia Scop.** 573.
- Stems prostrate or ascending, 10—20 cm. Leaflets shorter and broader than in the last. Fls smaller.—Alp., subalp. and Jura. 7 **montána Dec.** 574.

158. **Cicer. Sweet Vetch.** XVII, 10.

1. Fls solitary in the leaf-axils. Leaflets toothed.—Rarely (*e. g.* in Tess.) cultivated, and occasionally subspontaneous. 6 **† arietinum L.** 575.

159. *Vicia*. Vetch. XVII, 20.

1. Fls in racemes (sometimes few-, or 1-fl'd) with long peduncles. Peduncle, together with the raceme, at least $\frac{2}{3}$ the length of the leaf 2
- Fls in shortly peduncled racemes, or either single or geminate, sessile in the l.-axils 14
2. Racemes few- (1–6) fl'd. Fls rather small, 3–10 mm. Ervi spec. auct. 3
- Racemes many- (6–30) fl'd. Fls moderately large, 12 to 25 mm 7
3. Ls with 8–12 pairs of leaflets; common petiole terminated by a simple point. Pods sinuate, lumpy (contracted between the seeds).—Among corn; rare and probably adventitious. 7 † *Ervilia* Willd. 576.
- Ls with 3–10 pairs of leaflets; petioles of the upper ls terminated by a (gen. branched) tendril 4
4. Cal.-teeth as long as, or longer than, the cor. 5
- Cal.-teeth distinctly shorter than the cor. (Pods glabr.) 6
5. Racemes 1–3-fl'd. Pods glabr. Seeds compressed, lentil-shaped. Ls with 3–6 pairs of leaflets. Lentil. *Lens esculenta* Mönch.—Fields; cultivated, rarely subsontaneous. 6 † *Lens* Coss. Germ. 577.
- Racemes 1–3-fl'd. Pods hairy (rarely varied with pods glabr.). Seeds almost globular. Ls with 5–10 pairs of leaflets.—Fields; hedges; distrib. 4, 5 *hirsuta* Mönch. 578.
6. Racemes about the length of the ls, not awned. Pods gen. with 4 seeds. Hilum linear-oblong.—Fields; distrib. 5 *tetrasperma* Schreb. 579.
- Racemes finally twice as long as the ls, awned. Pods gen. with 6 (5–8) seeds. Hilum round-oval. Fls larger than in the last.—Cornfields; near Yverdon (probably adventitious). 6 * *gracilis* Lois. 580.
- 7 (2). Fls greenish yellow. Ls with 4–5 pairs of leaflets; leaflets oval, large.—Chestnut woods; W. (near Fully). 5 *pisiformis* L. 581.
- Fls red, violet, blue, or variegated 8
8. Style bearded below the stig. Racemes 5–12-fl'd 9
- Style uniformly hairy all round the upper part, or scarcely bearded. Racemes many- (12–30) fl'd 10
9. Ls with 5–7 pairs of leaflets; leaflets linear-lanceolate. Stipules semi-hastate, near the middle of the stem deeply 2–3-toothed. Fls purple-violet, as large as in 596.—Slopes; W. 5 *onobrychioides* L. 582.

- Ls with 4—5 pairs of leaflets; leaflets oval or oval-oblong. Stipules half-moon-shaped, with hair-like points, 5—7-toothed. Fls violet-red, later dirty yellow-red.—Mountain woods; here and there; distrib. 6
dumetorum L. 583.
- 10. Stipules half-moon-shaped, inciso-dentate. Ls with 5—9 pairs of oblong leaflets. Fls beautifully variegated with white and violet. Pl. glabr.—As the last. 6, 7
sylvatica L. 584.
- Stipules semi-hastate, the upper ones also lanceolate, entire. Ls with 6—15 pairs of linear, or linear-oblong leaflets. Fls blue or blue-violet **11**
- 11. Standard indented on each side in its upper third part; the lower part (the claw) twice as long as the upper. Cal. distinctly bossed at the base. Pods almost rhomboidal. Ann. or bienn. pl. *V. villosa* glabrescens Koch; the true *villosa*, which is not found in Switz., is easily distinguished by its soft, spreading villosity, and by its long, narrow cal.-teeth.—Among the corn, and in artificial meadows, rare and gen. variable; G. V. J. S. 6
varia Host. 585.
- Standard indented on each side, in the middle or lower third part; the lower part as long as, or shorter than, the upper. Cal. not bossed. Pods linear-oblong. Perenn. pls. Type of *V. Cracca* **12**
- 12. Carpophore (stalk of the pod above the cal.) longer than the cal.-tube. Pl. covered with a spreading villosity. Stems rather stiff, almost erect. Leaflets larger and often more numerous than in 587; lower tooth of the cal. subulate from the base.—Thickets, slopes; G. W. O. U. A. 5 **Gerardi Dec. 586.**
- Carpophore shorter than the cal.-tube **13**
- 13. Racemes fairly dense, about as long as, or rather longer than, the ls. Lower tooth of the cal. lanceolate (enlarged at the base). Hilum surrounding $\frac{1}{3}$ of the seed. Stem weak, climbing.—Hedges, among corn; road-sides; distrib. 6
Cracca L. 587.
- Racemes rather lax, gen. much longer than the ls. Hilum only surrounding $\frac{1}{5}$ of the seed. Stems firmer, more erect than in the last, racemes more closely set in the upper part of the pl., with larger fls.—Thickets; forest meadows; W. V. 5, 6, earlier than the last
tenuifolia Dec. (an Roth?) 588.
- 14 (1). Racemes 3—12-fl **15**
- Racemes 1—2-fl, (Fls appearing 1—2 together, sessile or very shortly peduncled, in the l.-axils. Ann. pls) **17**

15. Ls with 4—7 pairs. Perenn. pls. Fls of a dirty violet, rarely white or (v. *ochroleuca*) yellowish white.—Fields, road-sides; everywhere. 4, 5 . . . **sépium L. 589.**
 — Ls with 1—3 pairs. Ann. pls (leaflets large) . . . **16**
16. Petiole terminated by a simple point. Fls large, white, wings spotted with black. Hilum terminal. Broad bean. † **Faba L. 590.**
 — Petiole terminated by a simple or branched tendril. Fls smaller than in the last, of a dirty purple. Hilum lateral. —Bâle (Grenzach, Isteinerklotz). 5 **narbonensis L. 591.**
- 17 (14). Fls pale yellow. (Pods rough) **18**
 — Fls red or violet (varied rarely to white) **19**
18. Standard glabr. Leaflets obtuse.—Fields; rare; W. V. Z. L. A. 5 **lútea L. 592.**
 — Standard hairy. Leaflets truncate or indented.—Fields, very rare and only observed now and then; formerly near Cossonay and recently between Montreux and Chillon, at Colombey and near Lausanne. 5
 * **hybrida L. 593.**
19. Cal.-teeth lanceolate, the upper ones reflexed at the top. Pods stipitate. Leaflets all linear, indented with 2 acute lobes.—As the last; between Montreux and Chillon. 5
 * **peregrina L. 594.**
 — Cal.-teeth lanceolate-subulate, pointed forwards. Pods sessile **20**
20. Ls all, or at least the lower ones, terminated by a simple point, with 2 or 3 pairs. Stipules entire. Fls small (7—9 mm). Pods glabr.—Sandy hills, very rare; Peney, Canton Geneva, and Valère near Sion. 4, 5
lathyroides L. 595.
 — Ls with branched tendrils, the upper ones with 4—8 pairs of leaflets. Stipules toothed. Fls larger. Pods, at least when young, pubescent. Type of *V. sativa* **21**
21. Pods bossed, with a short pubescence, yellowish-brown when ripe. Seed compressed. Fls gen. of 2 colours. Ls gen. with 7 pairs. Leaflets, at least those of the lower and middle ls, truncate and gen. indented.—In corn-fields; distrib., also cultivated. 5 . . . **sativa L. 596.**
 — Pods narrower than in the last, not bossed, almost or quite glabr. throughout their entire development, black at maturity. Fls almost of one colour. Ls gen. with 5 pairs; leaflets of the upper and middle ls acute or acuminate. *V. Forsteri* Jord., *segetalis* Thuill.?, *nemoralis* Bor.—b. *Bobartii* Forst. Leaflets of the upper ls linear.—Hedges, fields, road-sides. Western and southern Switz.; also occasionally adventitious. 5
angustifolia Reich. 597.

160. *Láthyrus*. Pea. XVII, 20, 3.

1. Petiole terminated by a simple or branched tendril. Stem gen. climbing 2
- Petiole terminated by a simple point (which is occasionally wanting) or by a leaf. Stem gen. erect. *Orobispec. auct.* 12
2. Racemes 1—2-fld. Ls with 1 (rarely 2) pair. Ann. or bienn. pls 3
- Racemes several- (4—12) fld. Ls with 1 or several pairs. Perenn. pls 7
3. Fls yellow. Stipules oval, cordate-sagittate at the base, representing the leaflets which are wanting; sometimes (but rarely) the petiole is terminated by 1 or 2 narrow leaflets instead of the tendril (v. *foliolosa* Brébiss.; Schaffh.!) — Cornfields, here and there (wanting in W. U. A.). 6
Aphaca L. 598.
- Fls never yellow 4
4. Common peduncles much longer than the ls. Pods rough. Seed rough-granular. Fls violet blue.—Fields; not everywhere (wanting in G. A.). 6 *hirsutus* L. 599.
- Common peduncles shorter than the ls. Pods glabr. Seeds smooth 5
5. Pods linear, narrow (5—6 mm broad). Tendrils all simple. Style not twisted. Fls small, rose-coloured.—Fields, grassy places; Wall., Geneva (Branson, Naters; Vernier, Compesières). 5 *sphæricus* Retz. 600.
- Pods oblong, broader. Tendrils gen. branched. Style twisted on its axis 6
6. Pod channelled on the upper edge. Stipules as long as the petiole. Fls rather small, rose-coloured.—Fields, rare; V. B. J. 5 *Cicera* L. 601.
- Pod with 2 wings on the upper edge, broader than in the last. Stipules shorter than the petiole. Fls fairly large, white, rose, or blue.—Cultivated and rarely spontaneous. 5 † *sativus* L. 602.
- 7 (2). Fls yellow. Ls with 1 pair of leaflets. L. Lusseri Heer (subalpine form, almost glabr., with large fls).—Plains; everywhere. 6 *pratensis* L. 603.
- Fls red or blue 8
8. Stem angular. Fls bright purple. Rt-stock slender, with tubercles the size of a nut on its lower portions — Stubble; (only wanting in L. U.) 6 *tuberosus* L. 604.
- Stem winged 9
9. Petioles not winged. Fls purplish. Ls with 2—3 pairs. —Marshy places, not common (wanting in G. T. S.). 6
palustris L. 605.
- Petioles winged. Fls rose-coloured 10

10. Upper ls with 2—3 pairs; leaflets broader and more obtuse than in 607.—Mountain woods; G. W. V. B. O. J. U. Z. S. 7 **heterophyllus L. 606.**
 — All the ls with 1 pair of leaflets **11**
11. Leaflets linear-lanceolate, narrowed to a point, rarely (v. *angustifolius* = *L. ensifolius* auct. non Badar.) almost linear, or (v. *platyphyllus* Retz.) broader, oblong or oblong-lanceolate, 2 cm broad and more, rather obtuse, apiculate (Aigle). Fls greenish, streaked with rose.—Woods; distrib. 6 **sylvestris L. 607.**
 — Leaflets broader than in the last, oblong-lanceolate, rather obtuse, apiculate. Fls of a fine carmine-red. Style longer than in the last.—Thickets; Neuchâtel and Vaud, apparently spontaneous. 6 **latifolius L. 608.**
- 12 (1). Ls simple (petioles foliaceous), linear-lanceolate, grass-like. Racemes 1- (rarely 2-) fld. Fls purplish.—Fields, grassy places; rare (wanting in G. L. U. A.). 6 **Nissolia L. 609.**
 — Ls with 2—6 pairs of leaflets **13**
13. Ls with 2—3 pairs **14**
 — Ls with 4—6 pairs **16**
14. Stem narrowly winged, ascending. Rt-stock thickened here and there in tubercles. Leaflets oblong-lanceolate, rarely (b. *linifolius* Reich.) linear. *L. macrorrhizus* Wimm. *Orob. tuberosus* L.—Woods; distrib.; b. Tessin. 4 **montanus Bernh. 610.**
 — Stem not winged, only angular, erect **15**
15. Leaflets oval, long-acuminate, rarely (b. *gracilis* Gaud.) linear. Petioles longer than the stipules.—Woods; distrib.; b. Tess. 4 **vernus Bernh. 611.**
 — Leaflets almost linear. Petioles scarcely as long as the stipules. *L. canescens* Gr. Godr.—Neuchâtel (vallon de la Brévine). 6 **ensifolius Gay. 612.**
- 16 (13). Fls yellowish, then dark-yellow. Leaflets (large) elliptic-lanceolate, pointed. Stem simple.—Alp., subalp. and Jura (Dôle, Reculet). 6 **luteus Peterm. 613.**
 — Fls violet-red. Leaflets oval-oblong, obtuse, apiculate (turning black in drying). Stem branched.—Woods; here and there (wanting in U. L.). 6 **niger Bernh. 614.**

OBS. Among the cultivated plants of this family are the following also:

1. *Pisum sativum* L. (Seeds globular, rolling, of a light colour; fls gen. white).
2. *Pisum arvense* L. (Seeds compressed-angular, not rolling; fls variegated).
3. *Phaseolus vulgaris* L. (Racemes shorter than the ls). Haricot.
4. *Phaseolus multiflorus* L. (Racemes longer than the ls).
5. *Lupinus* (Ls digitate, with 5—9 leaflets).
6. *Galega officinalis* L.
7. *Soja japonica* Savi., recently cultivated experimentally.

29. Amygdaleæ (Stone-fruit).

161. Amygdalus. Amygdalus. XII, 15.

1. Petiole as long as, or longer than, the breadth of the leaf. Drupe not succulent, splitting irregularly when ripe. —Hills; W. (Saillon, Montorge). 3 **communis** L. 615.
- Petiole not half as long as the breadth of the leaf. Drupe succulent, indehisc. Comp. the genus *Persica*.

162. Persica. Peach. XII, 15.

1. Comp. the last! Amygdalus Persica L.—Cultivated in the gardens and vineyards of warm districts. 3, 4
† **vulgáris** Mill. 616.

163. Prunus. Prunus. XII, 15.

1. Fls almost sessile. Fr. velvety-tomentose (rarely varied to glabr.). Ls oval-cordate. Apricot. 3, the earliest of all fruits † **Armeniaca** L. 617.
- Fls distinctly peduncled. Fr. glabrous 2
2. Fls solitary or geminate. Fr. pruinose 3
- Fls in umbel-like fascicles, racemes or corymbs containing 3—several fls. Fr. not pruinose 5
3. Peduncles entirely glabr. Fr. erect, globular, 6—10 mm. A prickly shrub with spreading branches. Black thorn. —b. *fruticans* Weihe. Shrub less prickly. Fr. larger.—Hedges; thickets; everywhere. 4 **spinosa** L. 618.
- Peduncles pubescent. Fr. pendant, larger 4
4. Young branches pubescent. Pets orbicular, pure white. Fr. globular. Plum.—b. *italica* Borkh. Ls almost glabr. Fr. with hard flesh (Greengage).—Wooded hills, spontaneous or subsponaneous; cultivated everywhere in many varieties. 4 **insititia** L. 619.
- Young branches glabr., thinner than in the last. Pets longish, of a slightly greenish white. Fr. oblong. Damask-plum. 4 † **domestica** L. 620.
- 5 (2). Fls in 2—several-fl'd umbel-like fascicles, appearing about the same time as the ls or a little earlier 6
- Fls in racemes or corymbs, appearing after the ls 7
6. Ls thin, rather wrinkled, hairy underneath. Petioles with 1 or 2 glands at the top. Sweet-cherry.—Cultivated forms are: b. *juliana* Dec. Black-heart cherry; c. *duracina* Dec. White-heart cherry.—Woods. 4 **avium** L. 621.
- Ls rather hard, smooth, glabr., shining. Glands on the petioles 0 or mounting to the lower teeth of the ls. Shrubs or small trees with slender, spreading or drooping branches. Bitter cherry.—Cultivated forms: b. *austera* Ehrh., Morelle; c. *acida* Ehrh.; d. *aproniana* Schübl. Mart.

- Hybrid with the last?—Hills; western and south-western Switz., Schaffh. 4 . . . **Cérasmus L. 622.**
7. Racemes short, erect, few- (3—12-) fld. Ls round-oval, slightly cordate.—Wooded mountain slopes; here and there (wanting in U. L.). 5 . . . **Mahaleb L. 623.**
- Racemes long, gen. drooping, many- (20—30-) fld. Ls elliptic, slightly acuminate.—b. *petræa* Tausch. (Upper Wall.).—Damp woods, thickets; distrib. 5 **Padus L. 624.**

OBS. *P. Laurocerasus* L. Cherry-laurel, has evergreen, leathery, shining ls and erect racemes, it is often cultivated in shrubberies near the lake of Geneva.

30. Spiræaceæ.

164. Spiræa. Spiræa. XII, 14, 22. XXII, 24.

1. Shrubs with streaked, angular branches. Ls undiv., oval. Fls in corymbs.—Indicated as subspontaneous in Canton Neuchâtel. 5 . . . **† ulmifolia Scop. 625.**
- Herbaceous pls. Ls divided . . . **2**
2. Ls large, 2—3-pinnatisect. Fls gen. diœcious through suppression, in narrow spikes arranged in a panicle.—Woods; gorges; distrib. 6 . . . **Aruncus L. 626.**
- Ls interrupted-pinnatisect. Fls hermaphrodite, in cymes **3**
3. Ls with 4—6 pairs of segments, the largest oval-oblong, double toothed, the terminal one confluent with the upper lateral ones and appearing palmatifid with 3—5 lobes, (Ls green underneath or gray- or white-tomentose.) Root-fibres not thickened.—Damp meadows, ditches; everywhere. 6 . . . **Ulmária L. 627.**
- Ls with 15—20 pairs of segments; the largest ones oblong in contour, inciso-pinnatifid. Root-fibres thickened in tubercles.—Pasturages; not common (wanting in U. L. A.). 6 . . . **Filipendula L. 628.**

OBS. Numerous species are also cultivated in gardens and shrubberies; comp. C. Koch, Dendrologie.

31. Rosaceæ.

165. Dryas. Dryas. XII, 21.

1. Ls cordate-oblong, crenate, white-tomentose underneath.—Alp., subalp. and Jura. 6 . . . **octopétala L. 629.**

166. Geum. Avens. XII, 18.

1. Fls erect. Pets yellow, spreading, not unguiculate. Fr.-head sessile.—Hedges and thickets; distrib. 6
urbánum L. 630.

- Fls drooping. Pets of a reddish yellow, erect, with long claws. Fr.-head long-stipitate in the cal.—Damp fields, ditches; distrib. 4, 5 **rivale L. 631.**

OBS. Hybrid: *G. rivale-urbanum* (intermedium Ehrh.), *G. rivale-(Sieversia) montanum* (inclinatum Schleich.).

167. Sieversia. Sieversia. XII, 18.

- 1. Pl. producing stolons. Leaf-segments inciso-dentate, with sharp teeth, the terminal one with 3—5 lobes.—Detritus in the high Alp. 7 **reptans Sprgl. 632.**
- Pl. without stolons. Leaf-segments unequally crenate, the terminal one almost cordate at the base.—Alp. and Jura (Reculet, Salève). 6 **montana Sprgl. 633.**

168. Rubus. Rubus. XII, 23.

Preliminary remark: The genus *Rubus* is one of the most difficult! As all the characters are variable, too much importance should not be attached to any of them, but the aggregate of the characters, the habit, &c. should rather be observed. Then, in the first place it is well to examine only the constant and well-fructifying forms found in several places or in many different places far distant from one another. In collecting, it is important to take a portion of the young shoot, from about the middle, with at least 2 leaves on it. Comp. **Gremli, Beiträge zur Flora der Schweiz** (1870); **A. Favrat, "Les Ronces du Canton de Vaud,"** in the Bull. Soc. Vaud. (1881); **W. O. Focke, Synopsis Ruborum Germaniæ** (1877); and, for the special study of *Glandulosi*, my article in the **Oestr. botanische Zeitung** (1871).

- 1. Stem ann., 10—20 cm. Stipules free or hardly united to the petiole. Ls ternate, green underneath. Fr. red, gen. with only 2—5 drupels.—Mountain woods; distrib. 5 **saxatilis L. 634.**
- Stem gen. bienn.; the first year (the so-called "shoot") it is gen. simple and only bears ls, in the second year it produces flower bearing branches*) in the axils of the, now gen. fallen, ls. Stipules springing from the petioles 2
- 2. Ls pinnate with 5 (3—7) leaflets, the terminal one stalked. Fr. red covered with a persist. pubescence. Shoot erect-arched, cylindric, pruinose, gen. covered with numerous fine, dark-red aciculi. Leaflets white-tomentose underneath (the var. *viridis* A. Br. with leaflets green underneath has not yet been observed in Switzerland). Stas short, almost 1-seriate. Raspberry.—Woods; distrib. 5 **Idæus L. 635.**
- Ls digitate with 3—5 leaflets, the terminal leaflet of a leaf with 5 leaflets is, rarely, itself 3-partite, thus making 7 leaflets, but then the terminal leaflet is sessile. Fr. black,

*) It is not unusual to find **radical** inflorescences, especially in *Glandulosi*, in *cæsius* and *idæus*, differing very much from the normal lateral inflorescences. These radical inflorescences are elongated, with many fls, and with leaves mixed with them.

rarely of a red-brown, or blue-black, glabr., rarely, when mature, having a tuft of hairs at the top 3

3. Ls tomentose on both sides or only (and always) underneath, green above and apparently glabr. but almost always, at least those of the inflorescence, with a sprinkling of very small stellate hairs (visible when magnified 50—60 times) 4

- Ls never tomentose above, green underneath or tomentose and then with or without simple hairs above, but without stellate hairs. *R. tomentosus glabratus* may be looked for here; comp. No. 636 5

Tomentosi.

4. Stipitate glands hardly ever wanting either on the shoot or inflorescence. Stipules linear. Lower lateral leaflets shortly stalked. Seps reflexed on the fr. Fr. glabr. Leaflets rather small, oblong-obovate, coarsely lobed-dentate, with cuneiform, entire base. Panicle narrow, fairly dense. Pets white, rather inclined to yellow. Petiole channelled. —Var.: Ls green above, (var. *glabratus*), or ash-gray-tomentose (v. *canescens*); shoot rarely tomentose-villous v. *villicaulis*) or with unequal prickles and numerous glands (v. *Lloydianus* Gen., if the ls are, at the same time, green above).—T. V. B. O. J. L. Z. S.

Tomentosus Borkh. 636.

- Glands few or 0. Stipules more or less foliaceous as in *R. cæsius*. Lower lateral leaflets sessile or very shortly stalked. Seps erect or spreading on the fr., rarely all reflexed. Fr. glabr. Hybrid forms between *R. tomentosus* and *R. cæsius*.
- Glands more or less numerous, never wanting. Stipules linear. Lower lateral leaflets distinctly stalked. Seps reflexed on the fr. Ovaries glabr. or pubescent. Hybrid forms between *R. tomentosus* and those species which have *stipitate glands*.*)
- Glands absolutely 0. Stipules linear. Lower lateral leaflets distinctly stalked. Seps reflexed on the fr. Ovaries glabr. or pubescent. Hybrids of *R. tomentosus* with the species which have *equal prickles and no stipitate glands*. These hybrids differ from the *Discolores* in the channelled petioles, the inflorescences with furrowed axis, the fr. incompletely developed and above all in the presence of small stellate hairs on the ls, which are scarcely ever wanting in the hybrids of *R. tomentosus*. Comp. also 50

*) Among these are *R. tomentosus-vestitus* and *R. tomentosus-Radula*. —Hybrid forms between *R. tomentosus* and the *Glandulosi* have not yet been observed in Switzerland.

5. Prickles similar or fairly so, relatively weak. Stipitate glands few or 0. Shoot cylindric, or angular, with flat faces, often pruinose gen. glabr. or with scattered hairs. Lateral leaflets (in the quinate, and also the middle ls) sessile or very shortly stalked. Stipules rather broad, almost foliaceous. Seps erect or applied on the fr., rarely one or other or all reflexed. Drupels gen. not numerous, often partly or entirely suppressed, those which are fully developed large, swollen, often dull or indeed pruinose.—The Suberecti which have also subsessile lateral leaflets differ in the high-arched or almost erect shoots which are not pruinose at least at the top, angular-furrowed, entirely without stipitate glands, and in the, gen. quinate, ls green on both sides, and the seps bordered with white, and the stas not conniving after the emission of pollen.—*Corylifolii* 6
- Prickles very unequal, sometimes also less unequal but then the larger ones feeble. Stipitate glands always very numerous, gen. long. Shoots gen. cylindric. Lateral leaflets gen. distinctly stalked. Stipules linear. Seps, on the fr., almost always erect. Drupels as in the 3 following groups, shining. Ls often ternate.—*Glandulosi* 7
- Prickles unequal, the large ones more or less vigorous, or prickles fairly equal and in this case the stipitate glands often rarer, but never entirely wanting. Shoots often angular. Lateral leaflets gen. distinctly stalked. Stipules linear. Seps, at least those of the lateral fls, gen. reflexed on the fr.—*Subglandulosi* . . . 29
- Prickles similar or almost so, often vigorous. Stipitate glands numerous, but no intermediate forms between the prickles and stip. glands. Stems angular. Lateral leaflets and stipules as in the last paragraph. Seps reflexed on the fr., rarely only spreading. Ls gen. white-tomentose underneath.—*Radulæ* 44
- Prickles equal, gen. placed on the angles of the shoots. Stip. glands, also in the inflorescence, absolutely 0 (only in *R. Mercieri* there are a few). Lateral leaflets distinctly stalked, only in some species, which have ls green underneath, they are almost sessile. Stipules and seps as in the last paragraph 46

Corylifolii.

6. Ls always green underneath! Shoots slender, always cylindric, bluish-pruinose, with weak, gen. fairly similar, prickles. Seps erect on the fr. Carps glabr. Drupels bluish-pruinose. Inflorescence short, with branches often

divided near the base, fascicled.—Var.: Cal. with or without stipitate glands. Shoots with fairly similar prickles or (v. *armatus*) with numerous, unequal prickles; also b. *grandiflorus* Merc. More robust pls, hardly pruinose; fls very large.—Everywhere. 5 . . . *cæsius* L. 637.

- Ls, at least the younger ones (standing highest in the panicle) almost always gray-tomentose underneath. Shoots cylindric or angular, gen. slightly pruinose and with stronger prickles than in the last. Seps erect or spreading on the fr. Carpels glabr., rarely pubescent. Drupels not pruinose, shining or more often dull, gen. more or less suppressed. Branches of the inflorescence less fascicled and seps often more shortly acuminate than in the last.—Hedges, abundant near dwelling houses. 5, early but lasting until the autumn

dumetorum Weihe. 637a.*)

Glandulosi.

7. Stas gen. not numerous, sometimes almost 1-seriate as in *R. idæus*, at last, directly after the fall of the petals, distinctly shorter than the styles 8
- Stas numerous, many-seriate, decidedly as high as, or higher than, the styles 18
8. Styles red, at any rate below 9
- Styles greenish or white 12
9. Ls, at least the young ones, slightly gray-tomentose underneath. Shoots rather angular. Seps, on the fr., appressed or reflexed. Comp. *R. saltuum* 21.
- Ls green underneath. Shoots gen. cylindric. Seps, on the fr., erect or appressed 10
10. Shoots remarkably slender, poor in prickles. The large prickles varying little, bent. Stip. glands often rather rare, without much colour. Carps pubescent.—Lucerne. 7
gracilicaulis Grml. 638.
- Shoots stronger. Prickles and stip. glands very abundant, the former very unequal, the latter red or red-brown 11
11. Prickles fine, straight. Some of the stip. glands very long. Panicle with erect branches. Carps glabr. *R. Güntheri* Focke p.—Lucerne, Muri, Canton Aargau. 7

coloratus Grml. 639.

*) It is possible to distinguish: 1. Hybrids with the species which have similar prickles and **no stipitate glands** (especially with *bifrons* and *ulmi-follus*); stip. glands rare or 0; not rare. These, the second parent stem being often difficult to determine, may be united under the collective name of *dumetorum* Weihe;—2. with the species which have **stip. glands**; apparently rare;—3. with **tomentosus**, easily recognised by the microscopic stellate hairs on the ls; see *R. tomentosus*.

- The large prickles rather bent, thickened at the base. Stip. glands shorter than in the last. Panicle with spreading branches, often many-fld and mixed with ls. Carps pubescent, then becoming glabr. R. Güntheri echinatus Focke!—Vaud, Freiburg, Lucerne. 7
- polyacanthus Grml. 640.**
- 12 (8). Carps (and shoots) hairy **13**
 — Carps glabrous. **17**
13. Leaflets long-acuminate, soft white-tomentose underneath. Stas only half as high as the styles. Anthers reddish yellow.—Jorat, Wilchingen. 7 **Albicomus Grml. 641.**
 — Leaflets not tomentose underneath **14**
14. Pets broad. Stas almost as high as the styles. Leaflets unequally and deeply toothed, concoloured, with numerous rather glittering hairs.—Lucerne. 7
scabrifolius Grml. 642.
 — Pets narrow. Stas scarcely more than half as high as the styles **15**
15. Lateral leaflets rather shortly stalked. Shoots cylindric or slightly angular, rather pruinose. Prickles very abundant, rather short. Stip. glands rather pale, gen. exceeded by the hairs. Leaflets large, the teeth not deep. Panicle often many-fld. R. Bayeri Focke?—V. B. S. 7
firmulus Grml. 643.
 — Lateral leaflets distinctly stalked. Shoots cylindric, not pruinose **16**
16. Anthers greenish white. Leaflets acute, grayish underneath and almost without hairs. Axis of the inflorescence flexible. One of the smallest species.—Z. S. 7
brachyandrus Grml. 644.
 — Anthers reddish yellow. Leaflets acuminate, almost concoloured underneath. Axis of the inflorescence stiff. —Zürichberg. 7 **leptopétalus Focke. 645.**
- 17 (12). Shoots almost glabr. Leaflets elliptic-oblong, with broad, superficial, teeth, green underneath.—Tabor near Constance. 7 ***curtidens Grml. 646.**
 — Shoots densely covered with hairs. Leaflets oval-oblong, long-acuminate, with deeper, narrower teeth, the younger ones often gray-tomentose underneath.—Wilchingen, rare. 7
tardilórus Grml. 647.
- 18 (7). Styles red **19**
 — Styles white **23**
19. Pets broad, almost orbicular. Young leaflets gray-tomentose underneath.—Kreuzlingen. 7 **obtusiflórus Grml. 648.**
 — Pets narrow **20**
20. Carps pubescent **21**
 — Carps glabr. (Prickles straight) **22**

21. Shoots fairly thick, cylindric. Leaflets green underneath. Prickles fine. Some of the stip. glands very long. Seps, on the fr., erect.—Zürich. 7 **tenuiglandulosus Grml. 649**
- Shoots slender, rather angular. Young leaflets gen. thinly gray-tomentose underneath. The large prickles bent, or at least inclined, thickened at the base. Stip. glands of the inflorescence short, scarcely exceeding the tomentose hairs. Seps, on the fr., spreading or reflexed. Panicle elongated, often many-fld and mixed with ls. Middle branches of the panicle often divided near the base, so that several peduncles appear to spring from the same point.—V. B. Z. S. J. and probably in other parts; one of the late species. 7, 8 **sáltuum Focke. 650.**
22. Axis of the inflorescence flexible. Stip. glands red. Stas exceeding the styles. Ternate or quinate ls with leaflets deeply and irreg. inciso-dentate, suddenly contracted to a long point. Fls large.—Kreuzlingen. 7 **celtidifolius Grml. 651.**
- Axis of the inflorescence stiff. Stip. glands pale. Stas as high as the styles. Ls ternate.—Lucerne. 7 **remotus Grml. 652.**
- 23(18). Lateral leaflets shortly stalked (shoots slightly pruinose. Ls green underneath) **24**
- Lateral leaflets distinctly stalked. (Pets oblong-cuneiform or oblong-obovate) **25**
24. Pets oval-oblong, gen. rose-coloured. Drupels dull. Prickles bent, the large ones slightly thickened at the base. Leaflets unequally toothed, the terminal leaflet oval-oblong, shortly and broadly acuminate. R. prasinus Grml. Beitr. not Focke.—Z. S. early. 5, 6 **pseudopsis Grml. 653.**
- Pets large, broad, obovate, white. Drupels shining. Prickles fine, straight. Leaflets large, fairly reg. toothed, the terminal one broad-oval or almost orbicular, suddenly contracted to a short point. A well-marked and easily distinguishable species!—G. W. V. B. U. Z. S. (near Chur with red styles!) 7 **villarsianus Focke. 654.*)**
25. Shoots densely covered with hairs. Ovaries glabr. Inflorescence short, few-fld; the 2—3 upper ls of the flower-branches very large, simple.—Tour de Gourze. 6, 7 **Burnati A. Favrat. 654a.**
- Shoots densely covered with hairs. Ovaries pubescent,

*) Allied forms are: **R. chlorophyllus** (cæsius-rudis ? Beitr.) and **nodiflorus Greml.**; also **R. semivestitus A. Favrat.** Shoots slender, slightly hairy, with almost equal prickles and few glands. Inflorescence less thickly fld. Lausanne.

- soon becoming glabr. (Inflorescence with very long prickles and stip. glands) **26**
- Shoots glabr. or with scattered hairs. Ovaries glabrous **27**
26. Panicle short. Stip. glands without much colour. Leaflets long-acuminate, very hairy underneath, shining.—Zürichberg. 7 **lamprophyllus Grml. 655.**
- Panicle elongated, narrow; the lower branches, placed in the leaf-axils, often forming a new panicle. Leaflets terminated by a short, broad point. R. hirtus W. K. ? —V. S. 7 **Weiheanus Grml. 656.**
27. Leaflets large, broad, rounded or cordate at the base, the teeth not deep, suddenly contracted to a narrow, often curved, point. Shoots cylindric, slightly pruinose. Prickles numerous but feeble, the large ones also. Panicle short, lax, with elongated, very spreading branches, often few-fl. —W. V. B. O. Z. S. 6, 7 **Bellardi W. N. 657.**
- Leaflets more or less cuneiform at the base, acuminate. Shoots obtuse-angled above, not pruinose. Prickles very abundant, the large ones much thickened at the base. Inflorescence mixed with ls, with erect-spreading branches **28**
28. Shoots entirely glabr. Young ls gray-tomentose underneath.—Wilchingen; rare. 7 **rigidatus Grml. 658.**
- Shoots slightly hairy. Ls green underneath.—V.; rare. 6, 7 **Reutéri Merc. 659.**

Subglandulosi.

- 29 (5). Seps erect or appressed on the young fr., at any rate those of the terminal fls **30**
- Seps reflexed on the fr. **35**
30. Ovaries glabr. Prickles very abundant, very unequal. Leaflets green underneath. Comp. R. Reuteri. 28.
- Ovaries at least partly pubescent **31**
31. Stip. glands very much scattered on the shoots, pale. Shoots slightly pruinose. Prickles fairly similar, feeble. Leaflets large, cordate-oval, suddenly contracted to a long point, green underneath. R. densiflorus and monticolus Grml. should perhaps be mentioned here.—S. 7 **helveticus Grml. 660.**
- Stip. glands more or less numerous, at least in the inflorescence, gen. red or brown **32**
32. Styles red. Panicle elongated, drooping, at least finally, with short prickles. (Pets narrow) **33**
- Styles greenish. Panicle of moderate length, always straight, with branches fairly reg. trifurcate **34**
33. Prickles unequal, curved or at least inclined. Leaflets, at least the young ones, gen. gray-tomentose underneath,

acute or acuminate. Stas about as high as the styles. Comp. *R. saltuum*. 21.

- Prickles almost similar, fairly vigorous, straight. Leaflets green on both sides, suddenly narrowed to a long point. Stas distinctly lower than the styles. Panicle leafless, with extremely short stip. glands! Wilchingen; rare. 7

curvistylis Grml. 661.

- 34. Shoots cylindric or obtuse-angular, very hairy. Leaflets ternate, obovate, cuneiform, with a short superposed point, having a grayish shining effect underneath on account of the numerous hairs. Branches of the panicle very spreading, villous. *R. Menkei* W. N. ?—S. 7

fraternus Grml. 662.*)

- Shoots (brownish red) angular, glabr. or with scattered hairs. Leaflets ternate or quinate, broad-oval or round-cordate, with a short, almost superposed, point, the young ones gray-tomentose underneath. Panicle interrupted, the lower branches almost erect. Cal. tomentose, with red glands. Prickles sometimes fairly similar, sometimes very unequal and then often irregularly placed, and, the small ones also, much thickened at the base, those of the peduncles abundant, hooked. Drupels, even when mature, crowned with a tuft of hairs. *R. trichocarpus* Timeroy? — Wall., Vaud, Freiburg, Zürich. 7

pilocarpus Grml. 663.

- 35 (29). Panicle elongated, gen. many-fld, with short prickles, often almost without any; lower branches often separated, axillary, and forming themselves into a panicle. Cal. white-tomentose. Pets rather narrow, reddish. Ovaries with long hair. Shoots always hairy, tinted with a particularly dull violet-brown. Leaflets either green or velvety-pubescent or gray-tomentose underneath. Resembling *R. saltuum*. *R. hispidus* Merc.?—V. S. 7

insericatus P. J. Müll. 664.)**

- The above characters not present **36**

- 36. Prickles more or less unequal. Stip. glands more or less numerous. (Shoots always hairy) **37**

- Prickles fairly similar. Stip. glands rare **40**

- 37. Leaflets gray- or white-tomentose underneath, dark green and fairly glabr. above; terminal leaflet long-acuminate. (Ovaries pubescent; pets rose-coloured) **38**

- Leaflets green underneath **39**

- 38. Leaflets gray-tomentose underneath. The large prickles curved, much thickened at the base. Panicle short, often

*) Allied to *R. teretiusculus*.

**) An allied form is *R. erythrostemon* A. Favrat.

- mixed with ls; the upper ls reduced to foliaceous bracts. *R. Koehleri* W. and N.?—Vaud, Freib., Zürich, Schaffh. 7
brevis Grml. 665.
- Leaflets, at least when young, white- or gray-tomentose underneath; the large prickles almost equal, long, slender, straight or slightly curved. Panicle elongated, lax. Stas much shorter than the styles.—Haut Jorat. 7
strictus A. Favrat. 665a.
- Leaflets snow-white-tomentose underneath, glittering and soft to the touch. Prickles almost straight. Panicle rather short or elongated by axillary branches, leafless towards the top.—Vaud, Schüpfen, Canton Bern, Schaffh. 7
suavifolius Grml. 666.
39. Leaflets broad-oval or almost cordate-orbicular, fairly reg. and not deeply toothed. Panicle of moderate length, very villous, gen. mixed with ls, with elongated, spreading branches. Ovaries glabr. or with scattered hairs. *R. foliosus* Grml. not W. N.—W. V. B. J. L. U. A. Z. S. and probably distrib. 7 *teretiusculus* Kalt. 667.
- Leaflets long-acuminate, deeply and irreg. toothed, with numerous brilliant hairs above. Panicle long, with short branches and no ls. Ovaries pubescent.—Wilchingen, rare. 7 *cannabinus* Grml. 668.
- 40 (36). Leaflets narrowed to a long, broad point, dull green, green or (v. *incanus*) gray-tomentose underneath. Shoots very hairy, stiff. Stip. glands very rare, pale. Panicle elongated, stiff, rather dense. Pets decid.! *R. pileostachys* Grml. Beitr. not Gr. Godr.—Wilchingen, Constance. 7
Gremlii Focke. 669.
- Leaflets not narrowed to a long broad point 41
41. Ovaries pubescent. (Shoots very hairy. Leaflets ternate or quinate, broad-oval or almost orbicular. Prickles of the inflorescence long, straight) 42
- Ovaries glabr. (Panicle short) 43
42. Leaflets rather firm, dark green on the upper side, green or whitish-gray underneath, but always rather rough to the touch on account of the thick, rather long, woolly, shining hairs. Panicle stiff, moderately long, villous. Pets white or pale-rose, broad. Prickles rather slender, gen. straight.—W. V. B. J. U. Z. S. and probably distrib. 7 *vestitus* W. N. 670.)*

*) Allied forms are: *R. pyramidalis* Kaltenb. Shoots less hairy, stip. glands very rare; prickles feeble, those of the inflorescence shorter and broader; leaflets more acuminate; inflorescence dense, pyramidal, later broad and obtuse at the top; pets rose-coloured—Val-de-Ruz, Chaumont, pied du Suchet.—Also: *R. Vetteri* A. Favrat! exsicc. (*teretiusculus tomentellus* Grml.) Inflorescence almost as in *R. teretiusculus* but the leaflets rather those of *R. vestitus*, at the same time not velvety-woolly, the young ones gen. white-tomentose underneath; prickles of the shoot almost equal, stip. glands rare or none.—Jongny, Bex.

- Leaflets thinner, lighter green above, white-tomentose underneath, but not, or only slightly, velvety-woolly. Panicle gen. shorter than in the last. Pets of a bright rose-colour, rather narrower. Almost exactly between *R. vestitus* and *R. bifrons*—V. S. 7 **conspicuus P. J. Müll.** 671.
- 43. Shoots glabr., slightly pruinose. Leaflets ternate, white-tomentose underneath; terminal leaflet rather rhomboidal, cuneiform, acute. Pets white. Prickles not abundant.—Lucerne, Zürich. 7. . . . **indotatus Grml.** 672.
- Shoots hairy, not pruinose. Leaflets quinate, green underneath, with a dense pubescence; terminal leaflet broad-oval, or obovate, suddenly and shortly acuminate. Pets rose-coloured. Prickles abundant (about 20 between two ls). Panicle villous, often exceeded by the last leaf.—Vaud; Favrat! 6, 7 . . . **piletostachys Gr. Godr.** 673.

Radulæ.

- 44 (5). Panicle broad, often many-fld, with long, thin, spreading branches and peduncles. Shoots red-brown, almost glabr. Pets narrow, always slightly rose-coloured. Seps often appressed on the fr. Stip. glands very numerous in the panicle, but short.—V. B. Z. S. and probably distrib. 6, 7 **rudis W. N.** 674.
- Panicle of moderate length, rather narrow. Shoots entirely glabr. Prickles and stip. glands very abundant. Stas as long as, or rather shorter than, the styles; styles reddish after flowering. Ovaries tomentose. *R. rigidus* Merc. not Sm.—Jura from Divonne. 6, 7 **rigidulus Schmidely.** 674 a.
- Panicle elongated, pyramidal. Shoots hairy . . . **45**
- 45. Panicle pyramidal, with long, rather vigorous, prickles in the lower portion. Stas exceeding the styles. Pets white or pale rose. The largest among those species which have stip. glands. Inflorescence more villous than in the last. Stas longer.—T. V. S., not common. 6, 7 **Radula Weihe.** 675.
- Panicle narrow, terminating in a raceme. Stas as high as the styles. Pets white.—Wilchingen, rare. 7 **racemigerus Grml.** 676.
- 46 (5). Seps entirely gray- or white-tomentose (with the exception of *R. Barbeyi*). Stas connivent after flowering or applied against the fr. Leaflets gen. gray- or white-tomentose underneath. (Inflorescence gen. paniculate).—*Discolores*. **47**
- Seps greenish, edged with white. Stas spreading after flowering. Leaflets green underneath. (Shoots high-arched, or almost erect, glabr. Lower lateral leaflets shortly stalked, or almost sessile.)—*Suberecti* . . . **60**

Discolores.

47. Shoots (unsupported) low-arched, often prostrate, flat-sided, with dense, tangled hairs and longer spreading ones. Prickles weaker in proportion. Leaflets large, delicate, coarsely toothed, slightly gray-tomentose underneath or (var. hypoleucus Focke) white-tomentose; terminal leaflet narrowed to a short broad point. Panicle very villous, often few-fl'd. Stas very long. Ovaries glabr. —Z. S. 7 **macrophyllus. W N. 677.**
- Shoots arched-ascending, or high-arched, rarely low-arched in the small pls **48**
48. Shoots and inflorescence, at any rate, the bracts, bearing isolated stip. glands. Inflorescence elongated pyramidal, many-fl'd, mixed with ls often up to the top; axis villous, with small hooked prickles of a blood-red colour, tipped with yellow. Pets bright rose. Ls digitate-quinate; leaflets broad-oval, short-acuminate, rather deeply and irreg. toothed; lower lateral leaflets of the ls of the panicle rather shortly stalked. R. spectabilis Merc.! not Pursh.—Vaud, Geneva, Neuchâtel, Bern, Zürich, Schaffh.; rather earlier than R. ulmifolius **Merciéri Genev. 678.**
- Stip. glands, even in the inflorescence, absolutely 0 **49**
49. Ls with numerous simple hairs above, (always?) mixed with stellate and fascicled hairs **50**
- Ls glabr. above, or only with simple scattered hairs, always without stellate, fascicled hairs **52**
50. Shoots with numerous stellate and fascicled hairs.—Ovaries hairy. Prickles numerous, much compressed at the base, rather flexible, almost straight, covered almost to the top with numerous fascicled hairs, those of the panicle almost of the same form, those of the petioles curved. Panicle and leaflets resembling those of R. ulmifolius.—Branson in Wall. **valesiacus Grml. 679.**
- Shoots glabr. or almost so. Ovaries glabr. **51**
51. Shoots high-arched, deeply angular-channelled. Terminal leaflets cordate-orbicular with a superposed point; lower lateral leaflets rather shortly stalked.—Unterhallau; rare. 7 **tumidus Grml. 680.**
- Shoots-arched, ascending, obtuse-angled or flat-sided. Terminal leaflet elliptic-obovate, short-acuminate; lower lateral leaflets long-stalked. Resembling R. bifrons.—Vaud, Bern, Zürich, Muri, Schaffh.; Hohentwiel, but nowhere common. 6, 7 **obtusangulus Grml. 681.**
- 52 (49). Seps greenish, edged with white. Stas shorter than the styles. Leaflets green underneath; terminal leaflet rounded at the base, very long-acuminate; lower lateral

- leaflets distinctly stalked. Prickles abundant with a short triangular base, then suddenly contracted to an inclined point. Panicle of moderate length, often mixed with ls. Pets white. Shoots almost glabr.—Jorat: Favrat! 7, 8
Barbeyi Favr. Grml. in. 682.
- Seps entirely tomentose. Stas as high or higher than the styles **53**
53. Leaflets pedate or digitate, with not very deep teeth. Pets gen. bright rose-coloured. Shoots gen. with more or less numerous stellate and fasciculate, applied hairs, often of a metallic gray when dried, sometimes pruinose
54
- Leaflets digitate, more deeply toothed. Pets white or pale rose-coloured. Shoots not scaly when dried, not pruinose
57
54. Branches of the panicle forming racemes (Focke). Panicle elongated, narrow, dense, with broad, curved prickles. Resembling *R. tomentosus*. *R. cuneifolius* Merc. not Pursh.—Salève. (Southern slopes near Monetier). 7
*** sphenoides Focke. 683.**
- Branches of the panicle (except the lower axillary ones) trifurcate. **55**
55. Ovaries glabr. Ls digitate-quinate; leaflets oblong-obovate-cuneiform, short-acuminate; lower lateral leaflets rather shortly stalked; branches of the panicle long, erect-spreading, as also the peduncles. Stas about as high as the styles. Prickles straight. *R. elongatus* Mercier not Sm.—Salève. 7 *** sabaudus Focke. 684.**
- Ovaries pubescent. **56**
56. Panicle elongated, tomentose, with dense stellate hairs, as if powdered with meal, without long spreading hairs, gen. with hooked prickles. Stas as high as the styles. Shoots pruinose. Leaflets pedate or digitate, very white-tomentose underneath, with an applied pubescence, without long hairs; greatest breadth above the middle, suddenly acuminate at the top. *R. discolor* auct. mult. *rusticanus* Merc., *amoenus* Port.—? *b. pilis patulis* (dalmatinus Tratt.?) Panicle villous. (Lower-Wall., Lausanne, Salève.)—Graub., Tess., Lower-Wall., Lakes of Geneva and Neuchâtel; rather late, first half of July.
ulmifolius Schott f. 685.
- Panicle tomentose with stellate hairs and, besides that, with longer spreading hairs, shorter than in the last and gen. with straight prickles. Stas exceeding the styles. Shoots not pruinose, but covered, after drying, with small scales of a metallic-gray colour. Leaflets almost always pedate, the stalks of the lower lateral leaflets often inserted remarkably high on those of the

middle lateral leaflets; other characters as in the last. *R. discolor* Merc.—T. W. V. B. L. U. Z. S. and probably distrib., rather earlier than the last **bifrons Vest. 686.**

- 57 (53). Shoots angular-furrowed, arched-ascending, gen. rather hairy. Leaflets glabr. above or, more often, with scattered hairs. Ovaries glabr. or with scattered hairs. (Stas gen. exceeding the styles) **58**

— Shoots high-arched or almost erect, gen. entirely glabr. during their whole development. Leaflets (of the shoot) almost always entirely glabr. above. Ovaries glabr. (comp. *R. candicans*). Type of *R. thyrsoides* **59**

58. Leaflets broad-oval or roundish-oval, acute or short-acuminate, soft-tomentose underneath. Panicle of moderate length, broad, often very compound, with stiff branches, often branched above the middle, the upper ones in corymb so that the panicle which is rather bulky and densely fld, is broad at the top; axis villous, gen. with fairly vigorous sickle-shaped prickles. *R. discolor* Grml. Beitr.—W. V. B. L. Z. S. 6, 7.

macrostemon Focke. 687.

- Leaflets oval-elliptic, long-acuminate, with applied tomentum underneath. Panicle elongated, lax, with very spreading branches, often few-fld; axis tomentose, scarcely villous. *R. Winteri* P. J. Müll.—Vaud, Geneva, Freiburg, Lucerne. **pubescens Weihe. 688.**

59. Panicle elongated, pyramidal, thinner towards the top, often more or less mixed with ls of which the lateral edges are turned upwards. Stas, even when spreading, decidedly exceeding the styles. Leaflets oval or elliptic, acuminate. Shoots almost always angular-furrowed. *R. argenteus* Grml. Beitr. not W. N.; *R. argyropsis* Focke.—V. Z. S. 6, 7 **thyrsanthus Focke. 689.**

- Panicle elongated, narrow, almost of equal breadth, with few prickles, leafless, *i. e.* leafy only at the base. Stas as high as the styles, almost in the same plane. Leaflets, especially the young ones, narrower than in the other *Discolores*, with rather broad, but fairly deep teeth. Shoots gen. with flat sides. *R. thyrsoides* Wimm. p.—V. J. B. L. Z. S. 6, 7 **candicans Weihe. 690.*)**

Suberecti.

- 60 (46). Shoot cylindric or obtuse-angular, and, except the extremity, often slightly pruinose. Prickles small, narrow-conic, straight, gen. of a blackish red colour. Ls, in weak pls, often only ternate, in vigorous pls quinate

*) *R. elatior* Focke. See Beitr. 50. Lausanne.

and often, by the division of the terminal leaflet, septinate; term. leaflet broad, short-acuminate. Inflorescence short, gen. few-fl'd, often leafy Fr., even when ripe, reddish brown; with a raspberry scent. *R. Idæus-fruticosus* Grml. Beitr. (but not hybrid).—V. B. O. L. Z. S. One of the earliest species, directly after *R. Idæus*, and before *R. sulcatus* **suberectus Anders. 691.**

— Shoots always angular or angular-furrowed, not pruinose. Prickles vigorous, compressed at the base. Ls gen. digitate-quinate. Fr. black when ripe **61**

61. Leaflets folded, the terminal one oval or cordate-oval, short- and broad-acuminate. Inflorescence of moderate length forming a simple raceme, or the later fls sometimes paniced. Stas about as high as the styles. Seps, of the fr., spreading. Lower lateral leaflets almost sessile as in the last. *R. fruticosus* auct. mult.—Zuggerberg: Herz, according to Focke. 6 **plicatus W. N. 692.**

— Leaflets flat, oval or cordate-oval, long-acuminate. Inflorescence rather elongated, gen. forming a simple raceme, less armed than in the last. Stas exceeding the styles. Seps, of the fr., reflexed. Lower lateral leaflets rather more distinctly stalked than in the 2 last. *R. fruticosus* Grml. Beitr. *R. fastigiatus* Merc.—V. J. Z. S. and probably in other places, but nowhere common. 6 **sulcatus Vest. 693.**

OBS. Among hybrid forms the following can be distinguished with some certainty: *bifrons-cæsius* (dumetorum Merc.?); *bifrons-saltuum*; *bifrons-tomentosus*; *bifrons-vestitus*; *cæsius-candicans* (Laschii Focke?); *cæsius-conspicuus* A. Favrat; *cæsius-Güntheri* A. Favrat; *cæsius-Idæus*; *cæsius-macrostemon*; *cæsius Mercieri*; *cæsius-obtusangulus* A. Favrat; *cæsius-poylacanthus* (Pélerin, Canton Vaud: Favrat!); *cæsius-rudis*; *cæsius-sulcatus*; *cæsius-Radula* (echinatus Lindl.? Ecublens, Canton Vaud, Favrat); *cæsius-thyrseanthus*; *cæsius-tomentosus* (nemorosus Merc not Hayne), *cæsius-ulmifolius* (patens Merc. p.); *cæsius-vestitus*; *cæsius-Villarsianus*; *macrostemon-tomentosus*; *Mercieri-tomentosus* (collinus Merc. not Dec.? chnoophyllus P. J. Müll. ex Genev. Salève); *Mercieri-ulmifolius-Schmidely*; *macrostemon-ulmifolius* (?); *Radula-tomentosus*; *Radula-ulmifolius*; *rigidulus-tomentosus* Schmidely; *rudis-tomentosus*; *rudis-vestitus*; *saltuum-vestitus*; *thyrseanthus-tomentosus*; *tomentosus-ulmifolius* (baldensis Kern., albidus Merc.? thyrsoideus degener Merc.?); *tomentosus-vestitus* (undulatus cinereus Merc. ex Focke; *ulmifolius-vestitus* Schmidely).

169. *Fragária*. Strawberry. XII, 19.

1. Leaflets rather thick, dark bluish-green, almost glabr. Hairs of the petioles applied. Cal. erect against the fr. —Cultivated and sometimes subspontaneous (*T. umbelliformis* F. Schultz!). 5 † **grandiflora Ehrh. 694.**

— Leaflets thinner, grass-green, with rather folded wrinkles. Hairs of the petioles spreading **2**

2. Lateral leaflets (gen.) shortly stalked. Hairs of the peduncles horizontal-spreading. Cal. spreading below

- the fr. Pls in every way more vigorous than 696. *F. moschata* Duch.—Woods, here and there (wanting in T. U. L. W.). 5 **elator Ehrh. 695.**
- Lateral leaflets almost sessile (rarely stalked). Hairs of all the peduncles, or at least of the lateral ones, erect or applied **3**
3. Cal. erect against the fr. The terminal tooth of the leaflets smaller than the others. Pedicels longer than in 697; fls often inclined to green, imperfectly diœcious. —Hills, slopes; not everywhere (wanting in T. U. L.). 5 **collina Ehrh. 696.**
- Cal. spreading horizontally, or reflexed under the fr. —Woods, slopes, everywhere. 5 **vesca L. 697.**

OBS. *F. collina-elator* (sericea Christ) near Binningen, Canton Bâle. —*F. Hagenbachiana* Lang appears to be a *collina-vesca* distinguishable from *collina* by the stalked leaflets and the stolons which, as in *vesca*, bear small rudimentary ls between the leaf-fascicles; in *F. collina* these rud. ls are only found in the lowest internode of the stolons.

170. *Cómarum*. Marsh Potentil. XII, 20.

1. Ls pinnate; leaflets 5 (3—7), compound, glaucous underneath. Pets black-red.—Bogs; here and there. 6 **palustre L. 698.**

171. *Potentilla*. Potentil. XII, 20.

1. Fls white or rose **2**
- Fls yellow **8**
2. Rad. ls pinnate. Stem 30—45 cm, gen. red.—Slopes, wood-sides, here and there; T. W. V. Z. S. 5 **rupestris L. 699.**
- Rad. ls digitate **3**
3. Rad. ls ternate **4**
- Rad. ls quinate **6**
4. Carps glabr. Pl. viscous-villous. Pets narrow. Styles red.—Rocky places; Val Forcola in the valley of Misocco, Graub. 7 **grammopetala Morett. 700.**
- Carps villous at the umbilicus **5**
5. Pets white. Stas filiform. Leaflets with about 4—6 teeth on each side. Pl. with or without stolons.—b. *permixta* Grml. Stolons gen. 0, stas conniving after the emission of pollen, instead of spreading (Vevey).—Wood-sides, slopes; distrib. 4 **Fragariastrum Ehrh. 701.**
- Pets the colour of peach fls, pale. Filaments of the stas almost as broad as the anthers. Leaflets with 6—10 teeth on each side, teeth narrower and more acute than in the last, the terminal tooth scarcely shorter than the

- lateral ones, which makes the leaflet less truncate. Pl. always without stolons. The base of the inside of the cal. deep red.—As the last; G. T. V. S. 4 **micrantha** Ram. 702.
- 6 (3). Stas glabr. Stem not very leafy, scape-like, bearing 1—5 fls.—Wood-clearings, rare; G. T. V. Z. S. 4
alba L. 703.
- Stas rough. Stem bearing several ls, several- or many-fld 7
7. Leaflets almost sessile, oblong-lanceolate, silky-ciliate. —Sunny calc. rocks, especially in the subalp. (wanting in O. B. L. S.). 6 . . . **caulescens** L. 704.
- Leaflets stalked, obovate-oblong; hairs looser, less silken, mixed with glands.—As the last; Salève near Geneva. 7
* **petiolulata** Gaud. 705.
- 8 (1). Pl. dying after the fr. matures. Pets shorter than the cal.—Village-roads; Bâle (Neudorf and Bartenheim). 6
* **supina** L. 706.
- Perenn. pls. Pets as long as, or (gen.) longer than, the calyx . . . 9
9. Ls interruptedly pinnatisect, white-silky underneath (more rarely on both sides); larger segments about 12 to 24. Stem prostrate and rooting.—Way-side ditches; everywhere. 6 . . . **Anserina** L. 707.
- Ls multifid-laciniate, tomentose underneath; lobes linear.—Alp.; W.; (Zermatt). 7 . . . **multifida** L. 708.
- Ls digitate, with 3—5—9 leaflets . . . 10
10. Stems prostrate and rooting (stolon-like), or ascending and not rooting, but in this case the fls are, at least partly, 4-merous . . . 11
- Stems ascending or erect, the lateral ones sometimes also rooting at the base. Fls 5-merous . . . 13
11. Stems ascending, not rooting. Caul. ls sessile. Stipules large, leaf-like, deeply 3—5-fid. Rt-stock thick, knotty. Fls small, gen. 4-merous. *Tormentilla erecta* L.—Woods, pasturages; distrib. 5 . . . **Tormentilla** Scop. 709.
- Stems prostrate and (at least in autumn) often rooting. Caul. ls petioled. Stipules gen. small, undiv., or 2—3-fid 12
12. Stems simple or not much branched, creeping. Leaflets quinate, oblong-obovate with coarse, rather obtuse teeth almost from the base upwards.—Fls large, pentamerous, gen. solitary.—Roads and ditches; everywhere. 6
reptans L. 710.
- Stems at first simple or not much branched, ascending, later decumbent and branchy. Leaflets ternate or quinate, elliptic, cuneiform and with edges entire at the base and inciso-dentate towards the top, with acute teeth. Fls 4-merous or 5-merous, smaller and more numerous than in the last, but larger than in 709. *P. nemoralis* Nestl.? *P. procumbens* and *mixta* auct. helv. *P. Gremlii*

- Zimmerer. *P. reptans*-*Tormentilla*!*)—Wood-clearings, rare; V. B. A. Z. S. 5 **ascendens* Grml. 711.
- 13(10). Ls gray- or white-tomentose underneath with short stellate hairs or longer, much matted, hairs 14
 — Ls green underneath 19
14. Ls ternate, tomentose, snow-white underneath.—Alp. G. W. 6 *nivea* L. 712.
 — Ls with 2—9 leaflets 15
15. Ls almost concoloured, gray-tomentose on both sides. Stipules of the rad. ls narrow-linear. *P. cinerea* auct. —Sunny hills; Istein not far from Bâle (comp. *P. Gaudini*). 4 **incana* Fl. Welt. 713.
 — Ls distinctly of 2 colours, green above. Stips lanceolate 16
16. Stems and petioles white-tomentose, without long, spreading hairs. Leaflets white-tomentose underneath, (more rarely gray-tomentose), cuneiform-obovate, rolled at the edges, inciso-dentate or almost pinnatifid towards the top. Pl. without a central rosette.—b. *demissa* Jord. Stem more decumbent; fls smaller, not so closely set.—Dry places, hills, road-sides; distrib. 6 *argentea* L. 714.
 — Stems and petioles laxly gray-tomentose and, in addition, with longer hairs. Leaflets gray-tomentose underneath, not rolled at the edges 17
17. Stems 15—30 cm, slender, springing, at least partly, laterally from the central rosette of ls, ascending or almost spreading in a circle, forming a lax corymb almost from the middle, with thin peduncles, bent at maturity. *P. Wiemanniana* Günth. Schum., *P. collina* Koch, *P. præcox* F. Schultz! *P. alpicola* Delasoié! *P. argentea-verna* auct.—As the last, rare; W. B. Z. S. (Orsières, Obergösgen, Ostermündingen! Laufenburg! Marthalen, Glattfelden, Schaffh.!) 5, earlier than the last, but continuing to flower almost the whole summer! Günthéri Pohl. 715.
 — Stem 30—70 cm, more vigorous than in the last, central (central rosette 0 at the time of flowering), erect or arched only at the base, terminated by a corymb with stiff peduncles, straight at maturity 18
18. Leaflets of almost equal breadth, oblong-lanceolate, pointed at both ends, reg. toothed (pectinate) throughout the whole length; teeth about 6—10 on each side, almost acute-triangular. Stem almost entirely erect. Habit of

*) The true *P. procumbens* Sibth. is more like *P. Tormentilla* and is a good species, fairly distributed in North Germany; *P. mixta* Nolte is a hybrid between *procumbens* and *reptans* and is certainly not unlike our plant. The true *P. procumbens* is found according to Zimmerer near Winterthur (Siegfried); *P. mixta* near Geneva (Chenevard).

718. *P. inclinata* auct. plur. and Koch p. not Vill., *P. finitima* Christ.—As the last: northern Switz. (Laufenburg, Eglisau, Schaffh., Hohentwiel, Constance); Geneva? 6
canescens Bess. 716.
- Leaflets obovate-oblong, with cuneiform, entire base, the teeth not descending so low as in the last; teeth 4—5 on each side, unequal, lanceolate-linear. Stem arched at the base. Habit of a vigorous *P. argentea*. Perhaps *P. argentea-recta*?—Southern Alpine valleys; W. (from Brieg to Branson). Geneva. 6 . *inclinata* Wall. 717.*)
- 19 (13). Fl.-stem central, erect, vigorous, 30—60 cm, very leafy, several- or many-fld, with glandular hairs in the upper part. Ls composed of 5—7 leaflets. Carps surrounded by a winged, leas-coloured keel.—Dry slopes, rare. G. T. W. and sometimes subsontaneous in other parts. 6 *recta* L. 718.
- Fl.-stems lateral, with few ls 20
20. Ls, at least the lower ones, composed of 5—9 leaflets 21
- Ls ternate (Alpine pls) 28
21. Rt-stock descending, few-branched. Stems gen. numerous, springing almost from a single point, several- or many-fld, ascending or spreading in a circle, not rooting. Leaflets not uncommonly 7—9, toothed almost to the base 22
- Rt-stock horizontal or oblique, branched. Stems prostrate or ascending, few-fld, the lateral ones often rooting. Leaflets 5 (rarely 7), gen. toothed only towards the top 23
22. Upper caul. ls fairly developed. Carps surrounded by a distinctly keeled nerve. Fls gen. fairly large. *P. intermedia* auct. not L. *P. Nestleriana* Tratt.—Stony, wooded places of the mount. and subalp. G. T. W. V. B. U. A. 6
heptaphylla Mill. 719.**)
- Upper caul. ls reduced. Carps without a distinctly keeled nerve. Fls gen. more numerous and smaller than in *P. verna*. Pl. tinted with red and almost villous with long, fine, soft, spreading hairs. The rad. ls remaining gen. until the following year, large, toothed almost to the

*) The *P. inclinata* auct (an Vill.?) appears to be composed of various forms partly hybrids; e. g. *P. incrassata* Zimm., *P. cana* Jord., *P. Kernerii* Borbas (*argentea-recta*).

**) *P. heptaphylla* (Mill.?) includes several forms which still need final examination: 1. *P. thuringiaca* Bernh. Lower Engadine, Lower Wall. Mont Chabert in the Jura. 2. *P. Nestleriana* Tratt. Château d'Oex, differing from the last in the very spreading teeth of the leaflets and in the upper ls being opp. 3. *P. Mathoneti* Jord. Valley of Champey. 4. *P. parviflora* Gaud. Pl. small, with small fls resembling *P. opaca*. Lower Wall. Freib. 5. *P. gentilis* Jord. Bevers in the Upper Engadine; also with small fls, but approaching *P. salisburgensis*.

- base. *P. rubens* Crantz.—Sunny hills, wood-sides. Only known for certain in northern Switz.: Bâle, Aargau, Zürich, Schaffh. 4, 5 **opaca** L. 720.
23. Rad. ls distichous on the rt-stock. Leaflets with silken, shining hairs at the edge, which make them appear as if surrounded by a silvery border as in *Alchemilla alpina*.—Pasturages of Alp., subalp. and Jura. 6
aurea L. 721.
- Rad. ls spirally arranged. Edges of leaflets not silvery-silken. Type of *P. verna* 24
24. Stipules of the rad. ls oval-lanceolate Pl. gen. more vigorous than *P. verna*, with softer hairs; leaflets gen. broader, overlapping at their edges, terminal tooth scarcely shorter than the lateral ones. Fls of a darker yellow. *P. maculata* Pourr. *P. villosa* Crantz, *debilis* Schl., *bal-densis* Kern. *P. alpestris* Hall f. *P. jurana* Reut. (forma *accedens ad vernam*).—b. *firma* Gaud. (*sabauda* Dec.). Stems stiffer, red; ls more shortly petioled; leaflets broader, with more crowded, obtuser teeth; fls smaller (Zermatt).—Alp., subalp. and Jura. 6
salisburgensis Hänk. 722. *)
- Stipules of the rad. ls linear 25
25. Leaflets (especially of the summer ls) with scattered stellate hairs below (which do not form an intricate tomentum). *P. cinerea* Gaud. quoad loc. vales.—Hills, grassy places; middle and lower Wall., Prättigau; sometimes in company with *P. verna*! 4 **Gaudini Grml.** 723. **)
- Leaflets entirely without stell. hairs 26
26. Hairs of the petioles applied or at least directed forwards, rarely spreading almost horizontally, but then rather stiff. Leaflets obovate or obovate-cuneiform, toothed only in their upper third part or as low as the middle (rarely oblong, of an equal breadth, and toothed almost throughout their whole length).—Sunny places, hills, grassy places, walls: everywhere. 4 . . . **verna** L. 724.
- Hairs of the petioles spreading almost horizontally. Hybrids of 720 and 724? 27
27. Fls large (18—25 mm, larger and of a deeper yellow than in the last); pets incised. Leaflets large, cuneiform-obovate, inciso-dentate only towards the end. Pls more robust than the last, with a pubescence recalling that of *P. opaca*, at last tinted with red.—Hills, wood-edges; S. (Wangenthal near Osterfingerbad); Z. (Gailinger Berg,

*) According to Zimmerer this species should be ***P. verna* L.**, while *P. verna* auct. should = ***P. opaca* L.**, and lastly *P. opaca* auct. = ***P. rubens* Crantz.**

) An allied form: *P. tirolensis* Zimm.**, mouth of the Tamina near Ragatz.

- Winterthur!) entirely identical also in the Pyrenees! and according to Freyn in Catalonia. 4 ***aurulenta** Grml. 725. *)
- Fls small; petals not incised! Leaflets small, oblong-obovate, toothed about as far as the middle, with rather obtuse teeth. Pl. tinged at last with a dirty brown-red, forming spreading, almost depressed tufts.—Wangenthal near Osterfingen with the last, Hard and Neftenbach, Canton Zürich 4 ***prostrata** Grml. 726.
- 28 (20). Stem ascending-erect, 3—10-fl, 10—20 cm high. Fls fairly large.—Var.: more spreading, with smaller ls, and silky pubescence (v. *pedemontana* Reut.; Zermatt).—Alp. 7 **grandiflora** L. 727.
- Stem prostrate or ascending, 2—7 cm high, 1—2-fl 29
29. Leaflets of a dull green, very villous on both sides.—High Alp. (wanting in V.) 7 **frigida** Vill. 728.
- Leaflets bright-green, glabr. above. Like a *P. verna* in miniature.—High Alp. and Reculet in the Jura. 7
- minima** Hall. f. 729.

OBS. Hybrids: *P. alba-Fragariastrum* (hybrida Wallr., *splendens* Koch not Ram.); *P. aurea-minima* (semiternata Hut. Port.); *P. Fragariastrum-micrantha* (spuria Kern.); *P. frigida-grandiflora* (valesiaca Huet.); *P. frigida-multifida* (pennina Grml., ambigua Gaud. not Jacquem.); *P. grandiflora salisburgensis* (rhætica-Grml.); *P. minima-salisburgensis*; *P. multifida-salisburgensis* (geranioides Schl. not Willd.).

172. **Sibbaldia**. **Sibbaldia**. V, 148.

1. Pl. small. Ls. ternate; leaflets cuneiform, 3-toothed at the top.—High Alp. Reculet and Mont Tendre. 6
- procumbens** L. 730.

173. **Agrimonia**. **Agrimony**. XI, 4. VII, 1. VIII, 17. IX, 1.

1. Tube of the fr.-cal. deeply furrowed almost to the base. Stem 50—80 cm. Ls without glands underneath.—Thickets, wood-sides; distrib. 6 **Eupatoria** L. 731.
- Tube of the fr.-cal. slightly furrowed only as far as the middle, thicker than in the last. Stem higher. Ls glandulous underneath.—As the last but much rarer; V. Wiesen-thal near Bâle. Gaissau opposite Rheineck. Gams, Dissentis. 6 **odorata** Mill. 732.

174. **Rosa**. **Rose**. XII, 23.

For a complete herbarium specimen a twig should be taken with the fr. developed and still bearing the calyx divisions.—Comp. **Christ, Rosen der Schweiz** (and the supplement to this work in **R. B. Z.**), this excellent book we have taken as our basis. Also: **Godet, Fl. du Jura**; **Déséglise, Cat.**; and **Burnat et Gremli, les Roses des Alpes maritimes**.—It is to be noticed that all the roses which have the divisions of the cal. erect have villous styles, or, which amounts to the same, that in all the species which have glabr. styles, the divisions of the cal. are bent back on the fr.

*) Other intermediate forms between *P. verna* and *P. opaca* are: **P. vitoriensis** Siegf. (f. *subverna*) and **P. turicensis** Siegf. (f. *subopaca*).

a. *Eglanteriæ*.

1. Fls yellow. Anthers sagittate.—Hills; W. (apparently quite spontaneous on the gypseous rocks near Nax: Wolf!); otherwise in gardens. 6 . . . *lutea* Mill. 733.
- Fls purple, rose or white 2

b. *Cinnamomeæ*.

2. Stipules of the non-flower-bearing branches narrow, with erect edges, almost conniving in a tube. Prickles bent and placed in pairs one opp. the other under the stipules. Leaflets simply toothed, gray-hairy underneath, without glands. Peduncles glabr. Branches of a red-brown.—b. *fulgens* Christ. Shrubs with shorter, more leafy, branches.—Water-side, turf-moors; Jouxthal, Belpmoos, Klingnau, Winterthur, Schaffh. &c.; b. Central Alp. (Lower Engadine, Upper Wall.). 5
cinnamomea L. 734.
- Stipules of non-fl.-bearing branches rather flat. Prickles gen. scattered, more rarely, on the fl.-bearing branches, in pairs 3
3. Prickles very unequal, *i. e.* besides the large prickles there are a number of smaller ones, setaceous and sometimes glandiferous, at least in the lower part of the pl.; in *R. alpina* the fl.-bearing branches are gen. without prickles 4
- Prickles similar, *i. e.* of the same form and size in the same part of a branch; in some species (esp. those with glandular ls) sometimes mixed with smaller setæ, but then the large prickles are bent. (Leaflets 5—7, rarely 9) 11
4. Prickles all quite straight, weak, setaceous, or rather stronger, subulate. (Peduncles of moderate length, or long; divisions of the cal. erect on the fr. and persistent until maturity) 5
- The large prickles more or less bent. (Divisions of the cal. pinnatifid; leaflets 3—7, rarely 9) 10

c. *Pimpinelleæ*.

5. Divisions of the cal. entire, rarely one or other with an appendage. Peduncles gen. solitary and without bracts, glabr. or with stip. glands. Leaflets gen. more than 7 (9—11, rarely 5—7) 6
- Divisions of the cal. slightly pinnatifid. Peduncles 1—3, with or without bracts, with stip. glands. Leaflets 5—7. (Cor. white or pale-rose) 9
6. Peduncles bent back after flowering, rarely straight. (Fr. red, gen. narrowed to a neck towards the top; leaflets glabr. or almost so) 7

- Peduncles always straight. Fr. globular or ovoid 8
7. Cor. of a bright purple-red. Fl.-branches gen. unarmed. Leaflets 7—11, gen. oblong, thin, without glands underneath, rarely with scattered glands (v. *scabriuscula* Chr., if the leaflets are, at the same time, almost orbicular); teeth of the leaflets almost acuminate, glandular; rarely simple and without glands (v. *simplicidens*). Stipules of the fl.-branches enlarged, with oblong auricles. Divisions of the cal. terminated by a rather enlarged appendage. Fr. gen. ovoid-oblong, rather obliquely narrowed to a neck at the top, sometimes (v. *lagenaria* Vill.) elongated, bottle-shaped, rarely (v. *globosa* Desv.) globular.—Var. with glabr. and hispid-glandular (v. *pyrenaica* Gon.) peduncles; leaflets almost 3 times as small and at the same time with straight fr.-peduncles (v. *parvifolia* Favr.); also with geminate peduncles and branches covered with subulate often geminate prickles (v. *aculeata* Ser., *adjecta* D.*)—Mount. and subalp.; distrib. 6
- alpina** L. 735.
- Cor. as in the last. Fl.-branches with prickles. Leaflets 5—7, oval, firmer than in the last, whitish-green underneath and with scattered glands. Teeth, stipules and cal.-divisions as in the last, but fr. shorter and less distinctly narrowed at the top.—Engadine; Chr. 6
- reversa** ? W. K. 736.
- Cor. pale rose or white. Fl.-branches with prickles. Almost equally related to *R. alpina* and *R. spinos.*; leaflets 7—9, smaller and shorter than in *R. alp.*; teeth shorter, less glandular or almost without glands; stipules rather narrower than in *R. alpina*, but broader than in *R. spinos.* from which (the latter) it is distinguished easily by the red fr. slightly narrowed at the top, and borne on curved peduncles; by stems with fewer prickles, and by more-elongated leaflets, with teeth partly glandular. *R. alpina-spinosissima*; *R. gentilis* Koch.—Jura (Salève, Mont Forel near Beaulmes, Chaumont, Ravellenfluh, Schartenfluh, Ramsfluh). 6 ***rubella** Sm. 737.
- 8 (6). Leaflets small, 7—9, oval-orbicular, glabr., gen. simply toothed and not glandular underneath, rarely (b. *Sirei* Christ.) doubly toothed and with scattered glands underneath. Stipules narrow, suddenly widened towards the top, with lanceolate, diverging auricles. Peduncles gen. glabr. Peduncles white, rarely rather rose-coloured (v. *rosea*). Fr. globular, blackish at maturity. *R. pimpinellifolia* auct.—Var. with less numerous, smaller

*) D. = Déséglise; Chr. = Christ.

prickles and at the same time larger and stronger ones (v. *spretata* D.), or entirely unarmed (v. *mitissima* Grml.), with peduncles hispid-glandular (v. *hispidata*), and with fr. peculiarly pear-shaped, narrowed into the peduncle (v. *Mathoneti* D.).—Stony slopes of the Jura from Geneva to Schaffh. Roche! O. 5 . . . **spinosissima** L. 738.

- Leaflets 7, elliptic, hairy and glandular underneath, doubly toothed; teeth narrower and directed more forwards. Stipules less suddenly dilated at the top, with oblong auricles. Peduncles hispid-glandular. Pets of a gray-rose-colour underneath, purplish above. Fr. ovoid, red. R. *mollis-spinosissima*?—Rochefort, Canton Neuchâtel. 6 * **dichroa** Lerch. 739.

- 9 (5). Leaflets softly gray-tomentose (almost villous) underneath doubly toothed, at least those of the lower ls of the fl.-branches, with hidden subfoliar glands. Distinguished from R. *mollis*, *vestita* and the allied forms by the unequal prickles and the roundish-oval leaflets of R. *spinosissima*. R. *coronata* Gren. R. *involuta* Sm. —b. *Ravellæ* Christ, Leaflets more elongated, less hairy, with the underside and the teeth covered with more numerous glands.—c. *subsimplex* Grml. Leaflets almost or entirely without subfoliar glands, with not very glandular teeth, sometimes indeed simple.—Salève near Geneva, Ravellenfluh, Canton Solothurn, Lägern. 6

Sabini Woods. 740.

- Leaflets almost entirely glabr., simply or indistinctly double toothed, without subfoliar glands. Prickles $\frac{1}{2}$ larger than in R. *spinos.*—Salève. 6 * **sabauda** Rapin. 741.

d. Gallicanæ.

- 10 (4). Leaflets 3—5, large, rather leathery and dry, round-oval or broad-elliptic, with broadly-rounded or almost cordate base, rather obtuse at the end, without subfoliar glands, net-veined and grayish underneath, often folded together and bent back; teeth superficial, broad, spreading, without glands or with 1—3. Stipules narrow. Peduncles long, hispid-glandular. Cor. large, very open, bright-rose or almost purplish. Large prickles slender, slightly bent; smaller ones very numerous.—Var.: shrub of 3—5 dm, few- or 1-fl'd (a. *austriaca* Crantz); and higher 5—12-fl'd, at the same time with sharp teeth (b. *elata* Chr.).—Tess., Geneva, Zürich (Marthalen), Schaffh. 6

gallica L. 742.

- Leaflets 5—7, fairly large, thin, glabr., broad-elliptic or oval, pointed or short-acuminate, almost without subfoliar glands; teeth, especially the foremost ones, large, penetrating deeply, very sharp and directed

- forwards, less glandular than in *R. Jundzilli*. Stipules broader than in *R. gallica*. Peduncles fairly long, hispid-glandular. Cor. rose-coloured, smaller than in *R. Jundzilli*. Large prickles long, slender, very slightly bent; small ones fairly numerous. Rather low shrubs. *R. Jundzilli heteracantha* Chr., *R. gallica-Jundzilli*?—Between Osterfingen and Jestetten, frontier between Baden and Schaffh. 6 . . . **porrigens* Grml. 742 a.
- Leaflets 5—7, small or of moderate size, round-oval, oval or oblong-cuneiform, glandular underneath. Cor. small or fairly small. Large prickles vigorous, hooked **14**

e. *Synstylæ*.

- 11 (3). Styles united in a glabr., prominent column, equalling the stas. Divisions of the cal. short, almost entire. Stem prostrate or decumbent, with erect fl.-branches. Peduncles long, finely hispid-glandular. Cor. white. Var.: pl. larger, 5—10-fld, fls united in a corymb (v. *umbellata* God.); leaflets almost shining underneath with long thick hairs (v. *transalpina* Chr.); and with glabr. peduncles (v. *lævipes*).—Distrib. 6, 7 *arvensis* Huds. 743.
- Styles separate or adhering together in a short, not prominent column (comp. *R. stylosa*). Outer divisions of the cal. gen. pinnatifid **12**
12. Leaflets glandular underneath, at least on the stronger lateral nerves (these subfoliar glands are sometimes only distinct on the lower ls of the fl.-branches), always doubly toothed, *i. e.* the teeth flanked by one or several small teeth terminated by a gland **13**
- Leaflets without glands underneath or glandular at most on the central nerve (not on the lateral nerves *), simply (*i. e.* without glands), or doubly toothed **37**
13. Leaflets small or of moderate size, with numerous glands underneath and spread over the whole under-surface. Prickles, at least the larger ones, falcate **14**
- Subfoliar glands rare, only on the stronger lateral nerves, or fairly numerous, but then the prickles are straight, or almost so, and the leaflets large . . . **24**

f. *Rubiginosæ*.

14. Prickles unequal, *i. e.* by the side of large falcate prickles there are many smaller straight ones. (Ped-

*) For the subfoliar glands it is **always** necessary to examine the lower ls of the fl.-branches. By way of exception there are also some canine (with cal.-divisions erect on the fr) which have isolated subfoliar glands on the lateral nerves.

- uncles, and gen. also the back of the cal.-divisions, hispid-glandular, rarely almost or quite glabr.) . **15**
- Prickles equal, *i. e.* the branches bearing no small, straight ones **16, 17**
15. Leaflets oval or oblong, often rather cuneiform at the base, when young gen. glandular on both sides, the subfoliar glands very small, sometimes partly disappearing with age. Dense shrubs with a scent resembling that of the pink. Peduncles short, with few stip. glands. Cor. bright rose-coloured. Styles short, woolly. *R. caryophyllacea* Chr. not Bess.—Lower Engadine (Tarasp, Schuls), Bormio in Veltlin. 6 . . . **rhætica Grml. 744.**
- Leaflets almost always without glands above, but the subfoliar glands more numerous than in the last **16, 17**
16. 17. Peduncles and the back of the cal.-divisions hispid-glandular **18**
- Peduncles and the back of cal.-divisions gen. glabr. (Cor. white or pale rose-coloured; cal.-lobes and their divisions elongated, narrow.) Type of *R. sepium* . . . **22**
18. Cal.-divisions spreading or erect on the fr., persistent at least until the fr. becomes coloured. Styles hairy or woolly **19**
- Cal.-divisions reflexed on the fr., falling early (gen. before or during the colouring of the fr.). Styles glabr. or almost so. (Shrubs with lax, arched branches). Type of *R. micrantha* **21**
19. Cor. white. Leaflets of a yellowish green; prickles similar, yellowish; peduncles and styles rather longer than those of *R. rubiginosa*, but the styles less hairy. Leaflets orbicular-oval, rounded at the base. Peduncles very hispid-glandular.—Schaffh. (Piemont! Würtemberg). 6 **Gremlii Christ. 745.**
- Cor. of a bright rose-colour. Styles woolly . . . **20**
20. Leaflets oval or orbicular-oval, gen. broadly rounded at the base and more or less hairy, with broad, spreading teeth. Peduncles short, as long or scarcely longer than the fr., covered with unequal stip. glands mingled with fine prickles which often descend below the inflorescence. Cor. small. Styles short. Fr. globular or ovoid. *)—a. *umbellata* Leers. Dense shrubs with short branches, not unusually with unequal prickles (heteracanthous); peduncles often 3—7—15.—b. *comosa* Rip. Branches and prickles rather longer; peduncles 1—3; teeth of the leaflets rather more acute and cal.-divisions longer and narrower than in the last variety.—Distrib. 6 **rubiginosa L. 746.**

*) A dwarf form with prickles almost straight: var. *rotundifolia* Ran.; the same with very unequal prickles: var. *pimpinelloides* G. Mey.

- Leaflets oval, rather cuneiform at the base; teeth deep and slightly directed forwards (as in *R. sepium*). Peduncles long. Cor. large. Styles long. Prickles unequal. *R. gallica-sepium* Rap. olim.; *R. Kluckii* Gren. jur. non Bess.! *R. formulosa* Gren. rev. 6 **anisópoda** Christ. 747.
- Leaflets oblong, often slightly cuneiform at the base, dark green, almost glabr. Subfoliar glands less numerous and smaller, teeth of the leaflets rather finer and more closely set than in *R. rubig.*, peduncles longer, with fairly equal, sometimes rare, stip. glands. Fr. gen. elongated. Lax shrubs, with elongated, flexible branches covered with, gen. equal, prickles. Bâle, Schaffh. Zürich. 6 **flagellaris** Christ. 748.
- 21 (18). Leaflets small, oblong, often rather cuneiform at the base, glabr., or hairy only underneath on the central nerve. Peduncles fairly long, with almost equal stip. glands. Fr. oblong. Prickles similar. Cor. rather more brightly coloured than in the following. Teeth of the leaflets sharper, closer. *R. Hystrix* Lem.—Probably here and there. 6 **Lemanii** Bor. 749.
- Leaflets of moderate size, or small (often rather larger than in *R. rubiginosa*), oval, delicate, light green, more or less hairy. Peduncles fairly long, with, nearly equal, stip. glands, rarely (b. *permixta* D.) unequal and mixed with small prickles. Fr. ovoid. Differing from *R. rubig.* by its laxer and longer branches, its, gen. similar, prickles, its leaflets rather pointed at the base, its more acute teeth, its longer peduncles, pale fls, glabr. styles and its cal.-divisions reflexed on the fr. and falling early. *R. nemorosa* Lib. (leaflets large), *R. diminuta* Bor. (leaflets and fls small).—Probably distrib. (fairly common in western Switz.) 6 **micrantha** Sm. 750.
- Leaflets of moderate size, oval-oblong, rather hard, dark-green above, paler underneath, almost glabr.; subfoliar glands, especially on the upper ls of the fl.-branches, rarer, stipitate. Peduncles often peculiarly long and rather bent, with unequal, stip. glands mixed with small prickles which often descend below the inflorescence. Fr. ovoid, rather contracted at the top. Differing from *R. Pouzini* in the more numerous subfoliar glands, the glandular-hispid peduncles, and the teeth being broader and not so deep. Distinguished from *R. rubiginosa* by the longer peduncles, the glabr. styles and the cal.-divisions reflexed on the fr. *R. hispanica* Chr. p., *R. micrantha calvenscens* Burnat et Grml., *R. viscidula* Gren. ex Bouv.—Mornay! Savoy (near Thonon); Bormio! I have gathered it in Provence. 6 **viscida** Pug. 751.
- Comp. *valesiaca* 27.

22 (16. 17). Cal.-divisions erect on the fr. and persisting at least till the colouring of the fr. Styles woolly, short, capitate. Leaflets oblong or oval, more or less cuneiform at the base, enlarged towards the top and often rather obtuse. Peduncles often shorter than in *R. sepium*; the tips of the branches often reddish.—a. *cheriensis* D. (*Billetii* Pug. if the teeth are more obtuse and the peduncles hairy). Petioles almost tomentose.—b. *Jordani* D. Petioles almost glabr.; leaflets often rather larger.—Mount. and subalp.; W. V. B. O. and fairly distrib., at least in western Switz. 6 **graveolens** Gren. 752.)*

— Cal.-divisions reflexed on the fr. and falling early (as in *R. canina*). Styles glabr., rarely villous . . . 23

23. Leaflets oblong or narrow-elliptic, gen. narrowed at both ends, in any case at the base. Distinguished from *R. rubiginosa*, *micrantha* and their allies by the peduncles always being glabr.; differing from *R. tomentella* in having more numerous subfoliar glands, in form and in the tothing of the ls &c. Cor. almost always white. *R. agrestis* Savi!—a. *typica* (*virgulatorum* Rip. if the fr. is globular). Leaflets rather small, narrow-elliptic, narrowed at both ends, almost glabr.; teeth deep, pointed, directed forwards; styles glabr.—b. *pubescens* Rap. (*arvatica* Pug.?). Leaflets larger of a yellowish green, oblong, broader towards the top, more obtuse, hairy; teeth not so deep or sharp; styles villous; shrubs often rather low and with large fls.—c. *mentita* D. Leaflets large, elliptic-obovate, almost glabr.; teeth not very deep; subfoliar glands not numerous. Fl.-branches without prickles. Mont Clou, Lower Wall!—Probably distrib. at least in western Switz., rather later than *R. rubiginosa*. 6 **sepium** Thuill. 753.

— Leaflets oval, rounded at the base or scarcely pointed; subfoliar glands often less numerous. Resembling *R. tomentella*, and (except for the glabr. peduncles) *R. micrantha*.—W. V. (Outrerhône, Eclépens). 6 **abscóndita** Chr. 754.

* Spec. incertæ sedis.

24 (13). Peduncles glabr., rarely hispid-glandular. Cor. white or of a pale rose-colour. Styles hairy. Prickles large, bent. Cal.-divisions reflexed on the fr., with numerous broad appendages. Differing from *R. dumetorum* in the double-toothed leaflets, which are gen. more rounded and have scattered glands underneath. *R. tomentosa* dume-

*) Rarely found with scattered stip. glands on the peduncles and fls of a bright rose-colour. Comp. also **R. Vetteri Favrat**. N. Beitr. I, 10. = *glauca-graveolens*?

torum Gaud.!—a. *typica*. Leaflets oval or oval-orbicular, gen. gray-hairy on both sides; teeth not deep, spreading.—b. *affinis* Rau. Leaflets oblong, often rather pointed at both ends, more faintly hairy; teeth more acute—c. *nuda* Grml. (scabrata Crép.?) The same, but entirely glabr. d. *concinna* Lagg. Pug. Leaflets of the typical form but not very hairy or almost glabr.; teeth deeper, directed forwards; styles almost or entirely glabr.—e. *tirolensis* Kern. Peduncles hispid-glandular; styles glabr.; subfoliar glands rather more numerous.—f. *Borreri* Woods. Branches with scattered setaceous prickles.—Probably distrib., at least in western Switz. 6

tomentella Lem. 755.*)

- Peduncles hispid-glandular 25
- 25. Cal.-divisions reflexed on the fr., falling early . . . 26
- Cal.-divisions spreading or erect on the fr., persisting at least till the fr. is coloured. (Styles hairy) . . . 29
- 26. Styles glabr. Prickles bent in the form of a sickle, rarely almost straight. Cor. small, or of moderate size, white or pale rose-coloured 27
- Styles hairy. Prickles almost straight, gen. not numerous. Cor. large, bright rose-coloured, resembling that of *R. gallica*! Gen. rather low shrubs . . . 28
- 27. Leaflets small, rather tough, shining, glabr. or almost so, elliptic. Branches thin, often reddish, flexible, the fl.-branches bearing prickles. *R. hispanica* Chr. p.—Follatterres, Bovernier, Lower Wall. 6 . Pouzini Tratt. 756.**)
- Leaflets fairly large, thin, hairy at least on the stronger nerves underneath, oval. Fl.-branches without prickles. *R. Blondæana* Delas. p.—Wall. 6
- valesiaca Lagg. Pug. 757.***)
- 28. Leaflets glabr. on both sides; elliptic, acute or acuminate (the small ones, except in the tothing, resembling those of *R. canina*); teeth acute or acuminate, spreading obliquely or directed forwards. Fr. oblong or ovoid, rarely globular.—Differing from the typical form of *R. canina* in its, gen. lower, growth; the stems

*) The forms of *R. abietina* with glabr. peduncles (Friesii, Gisleri) differ in the widely-separated leaflets, of a bluish-gray underneath.

**) Our form (var. *subintrans* Gren.) differs from that of the south of France. This latter has leaflets of which the lateral nerves are without glands; it does not differ much from the hispid forms, with glabr. styles, of *R. canina* but its prickles are more distinctly sickle-shaped, its teeth very deep and branches thin, flexible and coloured with red.

***) *R. salvanensis* Delas. (Lusseri Lagg. Pug.?) appears to be a form of *R. micrantha* with densely villous leaflets and subfoliar glands rather rare.—Comp. also *R. tomentella tirolensis*, and *R. abietina* Gisleri.

often isolated, not much branched; the branches pruinose; the prickles rare, almost straight; the leaflets larger, tougher, almost triply toothed, slightly net-veined underneath and with scattered glands; the peduncles very hispid-glandular; the corollas large, bright rose-coloured and the cal.-divisions covered with numerous glands on the back and bearing numerous long, narrow appendages. *R. Godeti* Gren.; *R. virgata et biformis* Grml.; *R. Aliothi* Chr.; *R. gallica-canina* auct. p. (is certainly no hybrid!).—Rare: Neuchâtel, Solothurn, Aarg., Bâle, Schaffh. 6 *trachyphylla* Rau. 758.

- Leaflets often very large, more or less hairy at least underneath, often with more numerous subfoliar glands than in the last, broad-elliptic, rounded at the base or almost cordate, rather acute or slightly obtuse, resembling those of *R. gallica*, except for the teeth which are deeper and sharper); teeth broader than in the last, spreading or oblique. Fr. large, globular or rather narrowed towards the base (turbinate). *R. Jundzilliana* Bess.; *R. aspreticola* Grml.; *R. gallica-rubiginosa* auct. p. (certainly not a hybrid!)—b. *Pugeti* Bor. (foetida Reut. not Bast.!) Leaflets rather smaller, closer, rather more acute at the base, with more numerous subfoliar glands; teeth sharper, more glandular and directed forwards.—Rare: Geneva, Schaffh., Bachtel near Wald, Canton Zürich; b. Geneva, Schaffh. 6 . . . *Jundzilli* Bess. 759.*)

- 29 (25). Leaflets entirely glabr., rather distant and often tinted with red. Prickles slightly bent. Critical species, often confounded with certain forms of *R. montana* and *R. glauca*. *R. Laggeri* Pug. ex Chr.—Mount. and subalp., rare. Vaud, Salève! Freib., Neuchâtel. 6

alpestris Rap. 760.

- Leaflets more or less hairy, in all cases the petioles hairy 30
- 30. Leaflets with scattered hairs, glabr. above 31
- Leaflets hairy-tomentose, never glabr. above. (Prickles long, straight or almost so) 33
- 31. Leaflets small or of moderate size, oval or round-oval, often obtuse at the top, rather distant from one another, bluish-gray underneath, with not very deep teeth. Petioles tomentose, with almost sessile glands, red. Prickles more or less (but often very slightly) bent. Peduncles rather short, more or less hispid-glandular as also the

*) *R. speciosa* D., the typical form with setaceous prickles descending below the inflorescence and *R. pseudoflexuosa* D. var. *Fugeti*, with similar prickles descending to the branches, I have, hitherto, only seen from France.

back of the cal.-divisions and often also the fr. Prickles slenderer and cal.-appendages narrower than in *R. tomentella*. *R. foetida* Gren. not Bast., *R. conferta* Pug., *Dematanea* Pug.? *Thomasii* Pug.? *Friesii* Lagg. et Pug.? not Scheutz.—T. G.! W.! Vaud! Freib.! Bernese Oberland. Uri! Central and northern Jura. 6 *abietina* Gren. 761.*)

- Leaflets large, oval or gen. oblong. Prickles almost or quite straight, long, slender. (Cal.-divisions with a terminal, slightly enlarged, appendage) 32

32. Fr. small, almost globular, drawn together at the top. Peduncles fairly short, often several. Prickles rather bent. Differing from *R. trachyphylla* in the hairy petioles, the shorter peduncles and the cal.-divisions spreading or erect on the fr. *R. tomentosa* var. Crép.; *R. glaucatomentosa*? Favrat.—Mount. and subalp., rare. Vaud, Freib. 6 *Cotteti* Lagg. Pug. 762.**)

- Fr. large, ovoid, narrowed in the form of a neck towards the top. Peduncles long, gen. solitary. Teeth of leaflets deep, finely acuminate, directed forwards, with numerous glands. Prickles rare, straight, suddenly dilated at the base. Often resembling *R. alpina* in habit. Subfoliar glands often slightly stipitate. *R. Berneti* Schmidely. N. Beitr. I, 10, and *R. marginata* God. (leaflets glabr.) are also connected with this.—Mount. and subalp.; Jura from Geneva to Bâle and Aarau; also G. W. B. O. Z. (Albis). 6 *spinulifolia* Dematra. 763.***)

33 (30). Leaflets small or of moderate size, oval or round-oval, rarely oblong; the terminal leaflet scarcely larger than the lateral ones. Prickles gen. slightly bent. Comp. *R. abietina*. 31.

- Leaflets large, grayish, oblong, more rarely oval, the terminal one often distinctly larger than the lateral ones. Prickles straight or almost so, long, slender 34

*) Examples with glabr. leaflets (Lax in Wall.!) resemble *R. montana*.—It is necessary to separate from this species the following forms connected by Christ with *R. abietina*; *R. distans* Chr.! Leaflets green on both sides glabr. or almost so underneath, more or less strongly haired above (!); prickles straight or almost so. Resembling *R. trachyphylla* but the cal.-divisions reflexed on the fr. Schaffh. (Hemmenthal.)—*R. Gisleri* Pug. Peduncles very long; styles glabr.; cal.-divisions remaining reflexed. Uri.—*R. orophila* (Gren.?) Chr. and *R. Favratii* Christ.! appear to us to be composed of various forms. *R. abietina glaronensis* Chr.! appears to be allied to *R. eoriifolia* or *R. dumetorum*.

**) The following appear to be allied forms: *R. Godetæ* Chr. (alpestris God. non Rap.) from Canton Neuchâtel, and *R. marginata* Wallr. (tomentosa var. Rap.) from Salève, this last has leaflets entirely glabr., of a bluish green colour.

***) Probably a collective species; the plant of the Jura, according to Favrat may be *alpina-mollis*. The forms which are rather more hairy differ from *R. vestita* in having more acute leaflets, glandular underneath, darker cor. &c.; the glabr. forms differ from *R. salaevensis* in a more compound toothing, subfoliar glands, &c.

g. *Villosæ*.

34. Dense shrubs with rather short, straight branches. Peduncles short. Cor. bright rose-colour. (Cal. divisions erect on the fr., persistent until maturity and often continuing to grow. Styles woolly; fr. soon becoming pulpy sometimes slightly drooping). **35**
- Shrubs laxer, with longer, curved branches. Peduncles of moderate length or long. Cor. pale rose or almost white. Fr.-disk broader than in the last. Prickles less finely pointed, often slightly arched **36**
35. Cal.-tube and peduncles gen. thickly covered with strong stip. glands resembling small prickles. Leaflets gen. large, oblong with equal breadth, or elliptic, broad and rounded at the base. Shrubs of $\frac{1}{2}$ to $1\frac{1}{2}$ m. Fr. large, gen. globular.—a. *eglandulosa* (typica Exc. fl. 4th edit.). Leaflets large, densely villous, without glands on either side.—b. *recondita* Pug. Leaflets large, hairy, with numerous small, pale glands underneath.—c. *proxima* Cott. ex Chr. (mollis-pomifera?). Leaflets large, hairy with abundant glands underneath or on both sides, but broader, often rather acute; petioles covered with numerous stip. glands and with small prickles which descend partly, as also the villosity, to the branches; prickles numerous, often clustered together under the petioles. (Col de Chaude above Villeneuve).—d. *Grenieri* D. Leaflets smaller and often narrower or almost cuneiform, covered with a dense (almost shining) villosity, with or without scattered, coloured, subfoliar glands.—e. *Gaudini* Pug. Leaflets large, almost glabr., with abundant coloured glands underneath or on both sides; teeth broader.—f. *friburgensis* Lagg. Leaflets smaller, almost glabr., with abundant glands underneath or on both sides, the glands slightly stipitate; teeth sharper, very glandular; differing from *R. spinulifolia* in the more abundant prickles, the shorter peduncles and the fr. being covered with small glandiferous prickles, not neck-shaped (Montbovon).—Mount., subalp. and Alp., especially in the central chain (W. T.); very rare in the Jura. 6 **pomifera Herrm. 764.**
- Cal.-tube and peduncles covered with weaker stip. glands, the glands rarely (var. *spinescens* Chr. = *mollis-pomifera*?) supported by small setaceous prickles. Leaflets wrinkled, gen. smaller, closer, and often broader than in the last, oval or obovate, covered with a dense, soft (often shining) villosity; with smaller, shorter, closer, very glandular teeth. Low shrubs (1 m). Branches often covered with a bloom and streaked with violet-red;

cal.-divisions shorter than in *R. pomifera*; fr. often pear- or club-shaped. *R. mollissima* Fr. not Willd.; *R. ciliatopetala* Koch.; *R. omissa* D. Not always easily distinguished from the last, to which it is closely allied. —Mount. and subalp.; G. W. V. B. O. J. U. 6

mollis Sm. 765.

36. Fr. ovoid-oblong, distinctly narrowed towards the top like the neck of a bottle. Cal.-divisions erect on the fr., persistent. Styles woolly. Leaflets (often large and 7—9 in number) crowded, often touching. Prickles gen. rare, always straight. *R. alpina-tomentosa*! Differing from *R. mollis* in habit, and the teeth of its leaflets being longer and sharper; peduncles longer, fls lighter coloured and fr. more neck-shaped. Comp. *R. spinulifolia*.—Mount. and subalp., rare. Bouveret, Salève, Chaumont, Grändelfluh, Albis, Hörnli &c. 6

**vestita* God. 766.

- Fr. oblong, ovoid or globular not narrowed like the neck of a bottle. Cal.-divisions spreading or erect on the fr., gen. falling before maturity. Styles glabr., or hairy. Leaflets gen. rather distant. Prickles straight or slightly bent. Differing from *R. pomifera* and *R. mollis* in its laxer and long-branching growth (as in *R. canina*), the teeth of the leaflets broader, less glandular, sometimes almost simple, the peduncles longer, the cor. paler, the cal.-divisions gen. falling before maturity, and the fr. becoming pulpy later.—a. *Smithiana* Ser. Leaflets with a dense villosity underneath, soft to the touch, without glands, doubly toothed; teeth broad, cal.-divisions falling before maturity; fr. ovoid or oblong.—b. *subglobosa* Sm. (*ciliatopetala* God. not Bess., *dimorpha* Gren., *dumosa* Pug., *micans* D.! this last has tomentose fl.-branches). Leaflets with a dense villosity underneath, soft to the touch, without glands, irreg. or almost simply toothed; cal.-divisions very well developed, persist. for a longer time; fr. globular; peduncles often several.—c. *collivaga* Cott. (*coriifolia-tomentosa*?). Leaflets with a close tomentum underneath, without glands, doubly toothed; cal.-divisions persist. until maturity; fr. slightly neck-shaped towards the top; peduncles short.—d. *decolorans* Chr. Leaflets with a dense villosity underneath, without glands or almost so, irreg. or almost simply toothed, with not very deep, almost obtuse teeth; cal.-divisions as in var. a, but fr. obovate, small.—e. *scabriuscula* Sm.*) Leaflets less hairy underneath, but

*) Herr Christ distinguishes 1. *cuspidatoides* Crép. (*cuspidata* auct. not Bieb.) Subfoliar glands stipitate, scented; fr. globular. 2. *scabriuscula*. Subfoliar glands sessile; fr. oblong.

with more or less abundant glands, consequently rather rough to the touch, distinctly double toothed, with sharper, more glandular teeth; cal.-divisions falling before maturity; styles slender-haired or almost glabr. —f. *cristata* Chr. (Andrzeiowskii D. not Stev.). Differing from the preceeding forms by its cal.-tubes being entirely covered (as in *R. pomifera*) with stip. glands; leaflets double toothed; cal.-divisions erect, persistent.*)—Distrib.; c., d. and f. rare. 6 . *tomentosa* Sm. 767.

h. Caninæ.

- 37 (12). Leaflets hairy on both sides or at least underneath on the stronger nerves and on the petiole . . . 38
 — Leaflets glabr. on both sides, having, at most, scattered hairs on the petiole . . . 47
 38. Prickles long, straight, slender, suddenly dilated at the base. Leaflets large, oblong or oblong-oval, gen. gray-tomentose underneath. (Peduncles hispid-glandular) 34
 — Prickles more or less bent, some, also, almost straight, but shorter, gen. less distinctly dilated towards the base. Leaflets rounded, oval or elliptic . . . 39
 39. Styles forming a longish, glabr., prominent, almost columnar, head, especially at maturity, on the prominent, conical disk. Peduncles often several, elongated, covered with short, stip. glands. Cor. of a light rose-colour or white. Leaflets large, elliptic, shining, simply toothed. Prickles broad, much bent. *R. systyla* Bast.—Rather rare. Vaud, Geneva, Neuchâtel, Bâle; also in western Switz. 7 . . . *stylosa* Desv. 768.
 — Styles forming an almost hemispheric head, sometimes rather prominent, or free . . . 40
 40. Cal.-divisions reflexed on the fr. and falling early 41
 — Cal.-divisions spreading or erect on the fr., persist. at least till the fr. is coloured . . . 45
 41. Leaflets double toothed. Comp. *R. tomentella***) 24
 — Leaflets simply toothed . . . 42
 42. Peduncles hispid-glandular . . . 43
 — Peduncles glabrous . . . 44
 43. Low shrubs (1—1½ m), thick set, very leafy. Fls bright rose-coloured. Peduncles of moderate length, thickly covered with stip. glands (as in *trachyphylla*). Leaflets dark green, oval, rounded at the base. Prickles narrower than in *R. dumetorum* and *R. scaphus*. *R. gallica-scaphusiensis* Chr. (Fr., indeed, suppressed, but branches

*) *R. venusta* Scheutz, is, according to Christ, allied to *R. pomifera*, according to Scheutz to *R. tomentosa*; it is found, as also *R. alpina-venusta*, near Flims in Graubünden.

without aciculæ!) *R. Boreykiana* Bess. (Differing only in the presence of acicular prickles and ls with 2 pairs of leaflets).—S. (Neuhausen). 6 *collina* Jacq. 769.

— Gen. higher shrubs, with laxer branches. Fls white or very pale rose. Peduncles long, gen. only with scattered stip. glands. (Back of cal.-divisions glabr.) Leaflets elliptic. Comp. *R. dumetorum* 44.

44. Leaflets elliptic or oval, acute or acuminate, hairy on both sides or only underneath. Peduncles elongated. Styles more or less hairy or glabr. Shrubs gen. with lax branches. Differing from *R. canina* almost only in the hairy leaflets, which are almost always simply toothed (teeth not glandular). Cor. gen. white. *R. collina* Godet not Jacq.—a. *typica* (*R. Deseglisei* Bor., if the peduncles are hispid-glandular). Prickles not numerous, petioles gen. unarmed; leaflets grass-green or rather yellowish, rather hard, shining; teeth broader than in *R. canina*. Fr. gen. oblong.—b. *urbica* Lem. (platyphylla Rau, if the fr. is globular). Prickles rather more numerous; leaflets often bluish-green, hairy only underneath on the nerves, thinner, with sharper teeth; fr. ovoid or globular; transition form to *R. canina*.)—Distrib. 6

dumetorum Thuill. 770.

- Leaflets elliptic-obovate, often slightly cuneiform at the base and enlarged towards the top or slightly obtuse. with a dense, grayish villosity on both sides. Peduncles of moderate length, gen. rather shorter than in the last. Styles woolly. Shrub bushy. Fr. almost globular. Differing from *R. coriifolia* in the broader teeth, white fls with longer peduncles, and cal.-divisions reflexed on the fr. *R. obtusifolia* Chr. and Grml. not Desv.**) *R. coriifolia* scaph. Chr. (The *R. coriifolia subcollina* of Christ. includes the forms of *R. coriifolia* passing to *R. dumetorum* with cal.-divisions reflexed; his *R. glauca subcanina* includes the analogous forms between *R. glauca* and *R. canina*.)—Schaffh. 6 *scaphuscensis* Christ. 771.

- 45 (40). Peduncles hispid-glandular, of moderate length or short. Styles hairy or almost glabr. Leaflets irreg. double toothed; teeth not very deep. Comp. *R. abietina*.

*) Christ distinguishes also a form *mollis* with very gray-velvety leaflets and almost glabr. styles; *pseudocollina* with more numerous prickles and peduncles covered with abundant stip. glands; *brevissima* with rounded leaflets and broad prickles, resembling *R. tomentella*.

**) The true *R. obtusifolia* Desv. which I have observed in the south of France, differs in harder leaflets with broader and rounded base, acute at the top, yellowish green (not grayish), closer, with prominent nerves underneath; in glabr. styles, ovoid fr. &c. It forms a mean between *R. dumetorum* and *R. tomentella* affinis.

- Peduncles short, glabr., more rarely hispid-glandular. Styles woolly, short, capitate **46**
46. Leaflets elliptic-obovate, often slightly cuneiform at the base and, the lateral ones especially, rather enlarged and obtuse at the top, gen. very gray-tomentose (with close tomentum); teeth gen. simple. Cor. bright rose-coloured. Prickles coarse, hooked. Differing from *R. dumetorum* in its more bushy habit, shorter peduncles, hidden by large bracts, darker fls, styles short and woolly, and cal.-divisions erect on the fr. and persist. for a longer time.—Var. with double toothed leaflets (homologa Gren.): also: b. *Bouvernierana* Crép. Peduncles and cal.-divisions covered* with stip. glands; leaflets irreg. toothed, yellowish green. Wall.—c. *cinerea* Rap. (coriifolia-mollis?). Peduncles and cal.-divisions glandular, teeth and petioles with numerous glands; prickles suddenly dilated at the base. Salève, Randa.—d. *Bellevallis* Pug. Leaflets glabr. above, grayish green underneath and hairy only on the central nerve; cor. pale. Bovernier.—Mountains and subalp., fairly distrib. 6 **coriifolia** Fr. 772.
- Leaflets elliptic rather narrowed at both ends, with scattered hairs or almost glabr., bright green or rather yellowish; teeth deep, simple or with a few glands. Cor. pale rose-colour. Prickles numerous, slender, almost straight. *R. (tomentella) sclerophylla* Christ! —W. V. (Valleys of Binn and Saas, Bovonnaz). 6 **pseudopsis** Grml. 773.*)
- 47 (37). Cal.-divisions spreading or erect on the fr., persist. at least till the colouring of the fr. (Mountain varieties often having a bluish bloom on the branches, and the nerves of the leaflets, as also the stipules and bracts, frequently tinted with red). **48**
- Cal.-divisions reflexed on the fr. (almost applied to the cal.-tube), falling early. Peduncles fairly long; prickles bent) **51**
48. Prickles vigorous, more or less bent in the form of a sickle, and cal.-divisions gen. pinnatifid as in *R. canina*. Peduncles short, gen. glabr. Differing from *R. canina* in the same way as *R. coriifolia* from *R. dumetorum*, in its more shrubby habit, shorter peduncles, hidden by large bracts, cor. of a bright rose-colour, cal.-divisions

*) Differing from *R. tomentella* in the form and toothing of the leaflets the want of subfoliar glands, the cal.-divisions erect on the fr., the prickles slenderer, almost straight; it is more nearly allied to *R. concinna*. **R. sclerophylla** Scheutz has bent prickles, subfoliar glands, cal.-divisions reflexed on the fr. and glabr. styles.

- erect, persist. for a longer time, and its shorter, very woolly styles. Leaflets elliptic-obovate, often rather cuneiform at the base and, especially the lateral ones, rather obtuse at the top. Fr. larger, gen. globular or the central ones pear-shaped, becoming pulpy earlier. *R. vosagiaca* (vogesiaca) Desp.; *R. Reuteri* God.—Var. like *R. canina* with leaflets double toothed (v. *complicata* and *myriodonta* Chr.), peduncles with stip. glands (v. *caballicensis* Pug.), with peduncles with glandiferous aciculæ (v. *hispidior* Chr.), leaflets hairy underneath on the middle vein (v. *pilosula* Chr.), fr. long-pear-shaped (v. *falcata* Pug.). Transitional forms to *R. ferruginea* are *R. Seringei* Chr., *inclinata* Kern.—Mountains and subalp.; distrib. 6 *glauca* Vill. 774.
- Prickles slenderer, almost entirely straight, in any case more or less suddenly enlarged at the base. Cal-divisions without appendages or with, gen. narrower, appendages 49
49. Cal-divisions gen. undiv. Peduncles gen. fairly long and several, glabr., rarely (v. *hispidula*) rather hispid-glandular. Fr. small, globular. Leaflets elliptic, with slightly cuneiform, entire base, otherwise always simply toothed (with teeth directed forwards), bluish-glaucous, tinged with red. Cor. of a bright rose-colour. Prickles rare. *R. rubrifolia* Vill.—Alp., subalp. and Jura from Geneva to Bâle. 6 *ferruginea* Vill. 775.
- Cal-divisions more or less pinnatifid. Peduncles gen. 1—2, hispid-glandular. Fr. large, gen. oblong or ovoid, often rather neck-shaped towards the top 50
50. Peduncles with scattered stip. glands, or glabr. Cor. bright rose-coloured. Leaflets oblong-elliptic, acuminate, simply or (v. *Perrieri* Song) doubly toothed; teeth acuminate, directed forwards. Prickles long, straight, rather rare. Peduncles gen. solitary. Leaflets sometimes 9. *R. alpina-glauca*?—Mountains and subalp., rare. W. V. J. (Vissoie, Salève, Mont Chaubert, Chaumont). 6
- * *salævensis* Rap. 776.
- Peduncles and cal.-tube gen. thickly covered with glandiferous aciculæ (as in *R. pomifera*). Cor. pale rose-coloured. Leaflets rather distant, small, roundish-oval, obtuse, more rarely rather larger and acute, double toothed; teeth not deep, spreading, more rarely deep and acuminate. Prickles gen. rather bent.—Varied also with fr. globular (v. *Rionii* Delas.); also b. *sanguisorbella* Chr. (*montana-rubiginosa*?) dwarf form, with small leaflets and scattered glands underneath. Mont Clou above Bovernier. Similar forms are: c. *graveolens-montana* N. Beitr. I, 10, between Stalden

and St. Nicolas, and d. *Bormiensis Cornaz!* (rhætica-montana) N. Beitr. III, 45, from Bormio.—Mountains and subalp.; Wall., Salève, Neuchâtel. 6

montana Chaix. 777.

- 51 (47). Peduncles thickly covered with stip. glands. Pl. of a bluish green, and slightly tinted with violet-red, like *R. montana*, but prickles broader, bent; the stip. glands on the peduncles not so strong; appendages of cal-divisions broader, leaflets rather larger and more acute, those of the ls almost simply toothed. Differing from *R. montana* and *R. glauca* in having the cal-divisions reflexed on the fr.*) *R. canina-montana?*—Salève! 6

Chavini Rap. 778.

- Peduncles glabr. or with scattered stip. glands, more rarely with abundant glands, but then the ls gen. green 52

52. Cor. white. Appendages of cal-divisions almost without glands. Styles glabr. Leaflets dark green, shining, simply or irreg. toothed. Prickles scattered, much bent. Peduncles glabr. Recalling *R. stylosa!*—Vevey! Allaman, Salève, a slightly modified form also in Tessin. 6

glaberrima Dumort. 779.

- Cor. pale-rose or white. Appendages of cal-divisions more or less glandular: Styles gen. hairy, rarely glabr.—a. *Lutetiana* Lem. Leaflets simply toothed. Peduncles glabr. b. *dumales* Bechst. (biserrata auct., if the glands are still more abundant). Leaflets double toothed, peduncles glabr.; petioles, edges of stipules and cal-divisions with more numerous glands than in the last.—c. *andegavensis* Bast. Leaflets simply toothed; peduncles hispid-glandular.—d. *adenotrichia* Burn. et Greml. (hirtella and verticillacantha Chr.). Leaflets double toothed; peduncles hispid-glandular; styles rather glabr., on a slightly prominent disk.—e. *orthacantha* (firmula and dolosa God., mucronulata D.). Differing from the 4 last in having slenderer, almost or entirely straight prickles—Var. also with bright green or bluish green ls, and fr. oblong, oval or (v. sphaerica) globular.—These modifications are combined in various ways and Mr. Déséglise has defined more than 50 species on this type!—Distrib 6

canina L. 780.

OBS. I. Hybrids: **Cal. divisions bent back on the fr.**—a. Prickles unequal, i. e. mixed with smaller setaceous prickles. Here we find the hybrids of *R. gallica*, which are recognisable by the large leaflets, often only 5

*) *R. canina hispidissima* Chr., peduncles and cal.-tubes covered with strong stip. glands which descend below the inflorescence, but the prickles and leaflets of *R. canina* (Sion: Wolff!) appears also to be a hybrid!

in number, by the long hispid-glandular peduncles, by the large, open corollas often brightly coloured and by the suppressed fr.—† Leaflets with abundant subfoliar glands; *gallica-rubiginosa* (consanguinea Gren.).—†† Leaflets without subfoliar glands, more rarely a few scattered glands on the lateral nerves: *arvensis-gallica* (hybrida Sehl., spectabilis Rap., ambigens Grml.*); *canina-gallica* (depressa Grml., transmota-Grép, psilophylla Reut.); *gallica-mollis*; *gallica-tomentosa* (fimbriata Grml., genevensis D.).—b. Prickles equal.—† Leaflets with abundant subfoliar glands; *micrantha-sepium*; *sepium-tomentosa*; —†† Leaflets without subfoliar glands: *arvensis-canina*?; *dumetorum-gallica*.—II. Cal.-divisions erect on the fr.—1. Hybrids of *R. pomifera*: *cinnamomea-pomifera* (anopantha Chr.); *coriifolia-pomifera* (Semproniana Favrat. Schimp. f.); *ferruginea-pomifera* (Franzoni Chr.); *glauca-pomifera* (Murithii Pug.); *graveolens-pomifera* (personata Grml.).—2. Hybrids of *R. alpina*: *alpina-coriifolia* (stenosepala Chr., Mureti and Lereschii Rap., and according to Buser: Guineti Schmidely, N. Beitr. I, 11); *alpina-pomifera* (longicruris Chr., gombensis Lagg.).—The following require still further observation: *ferruginea-glauca*; *coriifolia-ferruginea*; *cinnamomea-coriifolia* (according to Christ); *rubiginosa-spinosissima*; and *canina-sepium* (according to Buser).

OBS. II. The following are sometimes found subspontaneous: *R. alba* L. (differing from *R. collina* in having unequal prickles, larger and more rounded leaflets, and white corollas; probably also a hybrid form of *R. gallica*); *R. turbinata* Ait. (according to Wolf near Sion, perhaps a *cinnamomea-gallica*); *R. blanda* Ait. (*fraxinifolia* Grml.; bois des Frères near Geneva, according to D.).

31. Sanguisorbeæ.

175. Alchemilla. Lady's-mantel. IV, 28. I, 4.

1. Ann. pls. Stas 1—2. Ls trifid.—Fields, fallow; distrib.
5—8 *arvensis* L. 781.
- Perenn. pls. Stas 4 2
2. Rad. ls divided at most to the middle into 5—11 lobes.
Type of *A. vulgaris* 3
- Rad. ls divided to the base or almost to the base into
5—7 segments 4
3. Rad. ls glabr. or almost so, div. to the middle; lobes
obovate, inciso-dentate only at the top, entire at the
sides. Teeth narrower and deeper than in 785—v. *villosula* Grml. Ls soft-villous (Saasthal).—Alp. and Colom-
bier from Gex in the Jura. 7 . . . *fissa* Schummel. 782.
- Rad. ls soft-villous, cut to $\frac{1}{3}$, into obovate lobes which
are inciso-dentate at the top, and entire at the sides.
Alp., not common; G. T. W. O. A. 7 . . . *pubescens* Bieb. 783.
- Rad. ls soft-villous, cut to about $\frac{1}{3}$; hairs underneath
almost silken; lobes almost half-orbicular, toothed
almost all round, *i. e.* almost to the angle of
division. *A. vulgaris* v. *subsericea* Koch.—Alp. and
subalp., sometimes also in lower districts and by the
side of the following. 5, 6 . . . *montana* Willd. 784.

*) Here probably also *R. decipiens* Bor. and *incarnata* Mill. both, according to D., near Geneva.

- As the last, but ls almost glabr. or with spreading hairs; inflorescence looser.—Pasturage, wood-edges; distrib. 5
vulgaris L. 785.
 - 4. Ls white-silvery-silken and shining underneath; segments lanceolate-cuneiform, toothed only at the top; teeth conniving; the segments rarely united to $\frac{1}{3}$ or almost $\frac{1}{2}$.—b. *subsericea* Reut. (not Koch). Segments oblong-obovate, inciso-dentate, with looser, almost dull tomentum.—Alp., subalp. and Jura; b. on granite earth (G. W. T.). 6 **alpina L. 786.**
 - Ls glabr. or with scattered hairs; the 3 middle segments obovate-cuneiform, deeply inciso-dentate. b. *cuneata* Gaud. Pl. with stronger hairs; segments less deeply incised; hybrid?—High Alp. 7. **pentaphyllea L. 787.**
- OBS. Hybrid: *A. alpina-vulgaris* (splendens Christ).

176. *Sanguisorba*. *Sanguisorb.* IV, 27. XII, 2. XXI, 24.

- 1. Fls hermaphrodite. Stas 4—12 2
- Fls polygamous or monœcius, the upper ones of the spike fem., the lower male, the middle ones often hermaph., rarely all unisexual. Stas 20—30. Type of *S. minor* Scop. (*Poterum Sanguisorba* L.) 3
- 2. Spikes oval-oblong, blackish red. Stas 4, about the length of the cal.-lobes.—b. *montana* Jord. Stem not so high, not very branchy; spikes larger; flowering earlier.—Damp fields; distrib. 6 **officinalis L. 788.**
- Spikes cylindric-elongated, yellowish green. Stas 6—12, much longer than the cal.-lobes.—G. (found once only by Heer between Flims and Trons); Veltlin. 7
***dodecandra Moretti. 789.**
- 3. Achenes with netted-wrinkles, and angles not winged. *S. minor* Scop.—Hills, slopes; distrib. 5
dictyocarpa (Spach.). 790.
- Achenes more deeply wrinkled in furrows; angles winged.—Artificial meadows, among lucern, introduced; Geneva, Neuchâtel and probably in other places. 5
muricata (Spach.). 791.

32. Pomaceæ.

177. *Méspilus*. *Medlar*. XII, 10, 12.

- 1. Ls oblong-lanceolate, with entire or slightly denticulate edge, loose-villous underneath. Fls solitary. Fr. brown. Medlar.—Thickets; rarely spontaneous. 5, 6
germanica L. 792.
- Ls cuneiform- or round-obovate, div. into 3—5 lobes, glabr. or hairy. Fls in corymbs. Fr. red. Hawthorn. *Cratægi spec. auct.* 2

2. Ls almost of the same colour on both sides, shining, lobes not deep, (partly also almost entire); lobes directed forwards, irreg. toothed. Styles and nuts gen. 2 — b. *macrocarpa* Heg. Ls almost as in 794. (Ettel, Wilchingen, Marbach and probably in other places).—Hedges, thickets; distrib. 5. *Oxyacantha* Gærtn. 793.
- Ls rather pale green underneath, more deeply div. than in the last, with lobes spreading more, toothed only at the end, entire at the sides; the lower lobes almost reaching the middle vein; the lateral nerves more prominent than in the last and bent backwards. Style and nut 1.—As the last, but about 15 days later
monogyna Jacq. 794.

178. *Cotoneaster*. *Cotoneaster*. XII, 7.

1. Cal. almost glabr. Fls in racemes of 1—3.—Rocky mountain slopes; distrib. 4. *vulgaris* Lindl. 795.
- Cal. woolly-tomentose. Fls gen. more numerous than in the last. Ls larger.—As the last. 4, 5 *tomentosa* Lindl. 796.

179. *Cydonia*. *Quince*. XII, 10.

1. Ls broad elliptic, with entire edge, woolly-tomentose underneath. Fls solitary.—Cultivated and rarely subspontaneous. 5. After the apple-blossom
† *vulgaris* Pers. 797.

180. *Pyrus*. *Pyrus*. XII, 13.

1. Anthers yellow. Styles united at the base. Fr. depressed-globular, hollowed at the insertion of the peduncle.—a. *sylvestris* Mill. (*P. acerba* Dec.). Full-grown ls glabr. underneath, green.—b. *dasyphylla* Borkh. (*P. Malus* Dec.) Ls throughout their entire development woolly-tomentose underneath.—Woods; a. everywhere; b. (original form of the Crab apples and the John apple) rare and probably only subspontaneous. 4, 5 *Malus* L. 798.
- Anthers red. Styles free. Fr. narrowed to the base (pear-shaped) or rounded-globular. 2
2. Ls finely toothed, glabr. when fully developed, shining; petiole about as long as, or rather shorter than, the leaf. Pear-tree.—Woods; earlier than the last *communis* L. 799.
- Ls entire, very woolly-tomentose underneath during the time of flowering, and when fully developed covered with weblike hairs above. Petiole only $\frac{1}{3}$ or $\frac{1}{2}$ as long as the leaf. *P. nivalis* Grml. not Jacq.?—Vuache, near Geneva! reported also from Wall. (Fully). 5 * *salvifolia* Dec. 800.
- OBS. *P. cordata* Desv. See N. Beitr. I, 11.

181. *Sorbus*. *Sorbus*. XII, 8, 13.

1. Ls imparipinnate. (Leaflets 11—19, oblong or oblong-lanceolate, woolly-tomentose underneath, the full-grown ones glabr.) 2
- Ls undiv., or lobed, or deeply pinnatifid at the base 3
2. Buds tomentose, dry. Styles gen. 2—4. Fr. globular, small, the size of a pea, scarlet. Service tree.—Woods; distrib 5 *aucuparia* L. 801.
- Buds almost glabr., glutinous. Styles gen. 5. Fr. pear-shaped (rarely globular), the size of a wild pear, yellowish red. Fls larger than in the last. Leaflets fairly equal at the base, while in the last the lower edge is decurrent on the stalk.—Woods; rare (in a wild state?), but plentifully cultivated. 5 *domestica* L. 802.
3. Ls with 3—5 strong lateral nerves on each side, of the same colour on both sides, glabr. (at least when full-grown), broad-oval in contour, lobed; lobes acuminate, the lower ones larger and penetrating more deeply. Fr. brown.—Woods; not everywhere (wanting in G. T. W. U.). 5 *terminalis* L. 803.
- Ls with 7—10 lateral nerves on each side, gray- or white-tomentose underneath, rarely (No. 808) green. Fr. red 4
4. Pets white, spreading 5
- Pets rose-coloured, almost erect. (Ls toothed) 7
5. Ls pinnatifid or pinnatisect at the base, with 2—4 lanceolate segments, separated on both sides. *S. fennica* Kalm. —a. *sub-Aria* (hybrida Koch = *Aria-aucuparia*).—b. *sub-scandica* (hybrida L. = *Aria-scandica*; this last in the Jura).—Mountain woods, rare; also cultivated. 5 * *hybrida* L. 804.
- Ls undiv. and toothed, or inciso-lobed 6
6. Ls slightly gray-tomentose underneath, inciso-pinnatifid. *S. suecica* Gark., *arioides* Michx. ex Gren. *Pirus intermedia* Ehrh.—Mountain woods; fairly distrib. in the Jura, otherwise very scattered. 5 *scandica* Fr. 805.
- Ls very white-tomentose underneath, unequally toothed or with small lobes.—Woods; rocky places; distrib. 5, rather later than the last (Godet) *Aria* Crantz. 806.
- 7 (4). Ls gray-tomentose underneath, or, through obliteration of the tomentum, almost green. Petiole shorter in proportion than the last, but longer than in the following. *S. Aria-Chamæmespilus*? (but fructifies abundantly).—Rocky places of the Alp., subalp. and Jura; rare. 6, 7 *Hostii* Jacq. f. 807.
- Ls green underneath, shortly petioled, smaller than in

the last (5—7 *cm*). Corymbs gen. denser.—Rocky places of the Alp., subalp. and Jura; calcareous soil. 6, 7

Chamæmespilus Crantz. 808.

OBS. *S. Aria-torminalis* (confusa Grml.; Lägern!).

182. Aronia. Rock-medlar. XII, 11.

1. Ls oval, denticulate, floccose underneath, glabr. later. Fr. of a blue-black resembling that of the Bilberry. *Amelanchier vulgaris* Mönch.—Rocky mountain slopes; fairly distrib. 4 **rotundifolia Pers. 809.**

33. Granateæ.

183. Punica. Punica. XII, 5.

1. Ls lanceolate, entire, glabr. Fl. of a bright scarlet red. Rocky slopes: completely naturalised in southern Tyrol like the vine; in Wall. (Tourbillon, Valère, but its existence appears precarious). 6 . . . **Granatum L. 810.**

34. Onagraceæ.

184. Epilobium. Willow-herb. VIII, 12.

1. Pets entire or emarginate. Stas and style inclined downwards 2
- Pets 2-lobed. Stas and style erect 4
2. Ls lanceolate, bluish-green and net-veined underneath. *E. angustifolium* Koch.—Wood-clearings; cut timber; distrib. 6. 7 **spicatum Lam. 811.**
- Ls linear or linear-lanceolate, almost of the same colour on both sides, not veined 3
3. Style villous at the base, about as long as the stas. *E. Dodonæi* Koch.—Gravelly places, water-side (wanting in T. U.). 7 **rosmarinifolium Hänk. 812.**
- The lower half of the style pubescent, style about half as long as the stas. Stem lower than in the last (up to 20 *cm*), ascending, with branches in the lower part. Ls rather larger, more distant; cal. brown-red. *E. crassifolium* auct. not Lehm.—Gravel-beds of alpine torrents; descending sometimes. 7 . . . **Fleischeri Hochst. 813.**
- 4 (1). The 4 stigs separate, spreading. Stem cylindric, without prominent lines 5
- The 4 stigs united like a club (in 820 and 823?), rather spreading at the top. Stem gen. with prominent lines 7
5. Young fls and branch-tips erect. Ls lanceolate, with but little variation in width, sessile, or the lower ones very shortly petioled 6

- Young fls and branch-tips drooping. Ls oval-oblong (broader below the middle), distinctly petioled. (Stem with a close pubescence.) Type of *E. montanum*. **9**
- 6. Fls large, 16—20 mm long. Ls clasping, slightly decurrent. Stem very branchy, covered with long spreading hairs, and small, gen. glandular, hairs, (which are sometimes wanting).—Ditches: river-side thickets; distrib. 6 **hirsutum L. 814.**
- Fls much smaller, about 10 mm long. Ls neither clasping nor decurrent. Stem simple or not much branched, villous with spreading hairs, rarely almost glabr.—Ditches, damp woods; everywhere. 6 **parviflorum Schreb. 815.**
- 7. Rt-stock with fleshy stolons (as in 824). Cal.-lobes acute.—V. O. (Jura near Geneva: wanting in the Alp.) 7 **Duriæi Gay. 816.**
- Rt-stocks with rosettes supported by small stems. Cal.-lobes obtuse **8**
- 8. Stem simple or not much branched, 30—60 cm. Ls shortly petioled, rather distant.—Rather shady places; walls, ditches, woods; everywhere. 6 **montanum L. 817.**
- Stem gen. much branched from the base. Ls very shortly petioled, crowded, broader and less acuminate in proportion than the last. Pl. smaller in every particular.—Walls and rocks, especially on granite earth, not on calc.; G. O. T. W. V. U. A. 6 **collinum Gmel. 818.**
- 9 (4). Stem without prominent lines, or only with 2 more thickly hairy streaks decurrent from the edges of the ls. Seed fusiform (narrowed at both ends). Rt-stock with elongated, filiform stolons. Ls narrow-lanceolate, or linear, rather obtuse, almost entire, sessile with cuneiform base.—Var.: Ls narrower (v. *simplex* Tratt.) and broader (v. *Schmidtianum* Rostk.)—Marshy fields, peat-moss; fairly distrib. 6 **palustre L. 819. *)**
- Stem marked with 2—4 lines which are often hairy and decurrent from the edges of the ls or petioles. Seeds obovate or obovate-oblong **10**
- 10. Ls all with distinct and long petioles, thin, oblong, pointed at both ends. Fls pale rose or white. Stem branchy. *E. tetragonum* L. herb.—Damp walls, ditches; distrib. 7 **roseum Schreb. 820.**
- Ls sessile or very shortly petioled **11**
- 11. Ls 3—4 in a whorl, rarely opp., slightly rounded at the base, lanceolate, acuminate. Stem almost simple. Fls of a light purple, larger than in the allied species.—Alp., subalp. and Jura. 7 **trigonum Schrank. 821.**

*) Hitherto regarded as a mountain form with large fls, more glabrous, and branched: *E. ramiflorum* Heg.

- Lower ls opp., upper alternate 12
- 12. Young fls and branch-tips erect. Stem 40—80 cm, gen. many-fld. (Ls sessile) 13
- Young fls and branch-tips drooping. Stem 5—30 cm, few- (1—5) fld. (Alpinæ pls) 14
- 13. Pl. bright green, middle ls sessile, lanceolate, gradually narrowing from a broad base to the tip, closely denticulate; inflorescence with short scattered hairs; fls 4—6 mm long, flesh-coloured (tetragonum auct. p.). Localities still to be established! . . . **adnatum** Gris. 822.
- Pl. rather bluish green; middle ls shortly petioled or sessile with a narrowed base, denticulation small, distant; inflorescence with dense short hairs; fls $\frac{1}{2}$ larger, rose-red.—Earlier than the last. V. J. Z. L. S.
Lamyi F. Schultz. 822 a.
 - Rt.-stock, even when flowering, having long stolons, bearing distant ls. Ls lanceolate. Fr. shorter than in the last, the valves rolling up in a circle. *E. virgatum* Fr. not Lam.—Peat marshes in the Jura (Gren.); Salvan, Bern, Aargau, Steinen in the Wiesenthal, Rothenthurm, Canton Schwyz. 6, 7 **obscurum** Rchb. 823.
- 14. Stolons subterranean, covered with scales. Ls shining, oval, rather obtuse, short-acuminate, with small, distant teeth, shortly petioled. Like a small *E. montanum*. *E. alsinefolium* auct. not Vill.—Alp. and Jura (Dôle, Marchairuz, Chasseron). 7 **organifolium** Lam. 824.
- Stolons above ground, leafy. Ls oblong or oblong-lanceolate, entire or scarcely denticulate, petioled. Like a small *E. palustre*. *E. alpinum* auct. (The pl. of Linnæus *E. alpinum* L. includes 4 species according to Hausknecht).—Alp. and Jura (Reculet, Mont Tendre). 7
anagallidifolium Lam. 825.
 - Seed papillose (in anag. smooth), narrower and with a more distinctly transparent process at the point; fr. gray-hairy; lower ls almost round, the remainder long-ovate. Rather resembling small forms of *palustre*. (*Heterophyllum* Heg. *alpinum* v. *nutans* Koch).—Alp., fairly distrib.; G. U. W. O. **nutans** Schmidt. 825 a.

OBS. Hybrids: *E. adnatum* *Lamyi-montanum* (Hausknechtianum Borb.); *E. adnatum-parviflorum* (according to Hausknecht); *E. adnatum-montanum*; *E. hirsutum-parviflorum* (intermedium Mér.); *E. montanum-obscurum* (aggregatum Celak.); *E. montanum-parviflorum* (limosum Schur. 1866, crassicaule Grml. 1870); *E. montanum-roseum* (glanduligerum Knaf.); *E. montanum-trigonum* (Freynii Celak.); *E. obscurum-palustre* (ligulatum Bakh.); *E. organifolium-trigonum*; *E. palustre-parviflorum* (rivulare Wahl, virgatum Reut. not alior.); *E. parviflorum-roseum* (persicinum Rchb., opacum Peterm.).—Also: *E. rosmarinifolium-spicatum* (according to Thomas); *E. adnatum-palustre* (semi-adnatum Celak.); *E. anagallidifolium-organifolium* (both, according to Hauskn., in Switzerland). *E. gemmiferum* Bor. (Winkleri Kern.), indicated on St. Bernhard, appears to be an intermediate form between *E. organifolium* and *E. roseum*.

185. *Oenothera*. *Oenothera*. VIII, 12.

1. Fls large, yellow, open only at night.—Dikes, shores; completely naturalised (Virginia). 7 **biennis** L. 826.

186. *Isnardia*. *Isnardia*. IV, 25.

1. Ls opp., oval, acute, entire. Fls solitary in the l.-axils. Resembling 843.—Marsh-ditches; rare; T. V. Z. 6 **palustris** L. 827.

187. *Circæa*. *Enchanter's Nightshade*. II, 7.

1. Peduncles without bracts. Ls flat, oval, rounded at the base, denticulate. Stem gen. hairy.—Shady woods; everywhere. 6 **Lutetiana** L. 828.
— Peduncles with very small setaceous, decid. bracts. Ls shining, oval, slightly cordate at the base, sinuate-dentate 2
2. Fr., through suppression of one cell, 1-celled. Stigma indented. Pl. 10—15 cm.—Shady, mountain woods, among the trunks of rotten trees; distrib. (wanting in S.). 6; earlier than the last. **alpina** L. 829.
— Fr. 2-celled. Stig. 2-lobed. Pl. larger in every way than the last. C. alpina-Lutetiana auct. (but is not a hybrid). —Mountain woods; fairly distrib. 6 **intermedia** Ehrh. 830.

188. *Trapa*. *Water-nut*. IV, 13.

1. Upper ls floating, rosetted, rhomboidal, coarsely toothed in front, with inflated petioles thickened in the middle; lower ls opp., pinnatisect with capillary segments and resembling roots. Fls solitary in the l.-axils, white. Fr. furnished with 4 spines, rarely with only 2 (T. verbanensis De Not.).—Stagnant water; T. (Lake Muzano); formerly also near Rheinfelden, Roggwyl (1870) and Elgg; the fruit is sometimes found among the debris of the ancient lake dwellings. **natans** L. 831.

35. Haloragææ.

189. *Myriophyllum*. *Myriophyllum*. XXI, 19.

1. Bracts of the fl.-whorls all pectinate-pinnatifid, sometimes several times longer than the fls, and resembling cauline ls, sometimes (v. pectinatum Dec.) scarcely longer than the fls.—Stagnant water; distrib. 6 **verticillatum** L. 832.
— Lower bracts inciso-dentate, as long as, or rather longer than, the fls, the upper ones entire, shorter than the fls, so that the whorls form a leafless spike.—As the last. 6 **spicatum** L. 833.

36. Hippurideæ.

190. Hippuris. Mare's-tail. I, 2.

1. Ls linear, in whorls of 8—12. Fls in the l.-axils, not very visible.—b. *rhaetica* Zschokke. Stem only 15—20 cm; ls narrower ($\frac{1}{2}$ mm broad).—Stagnant water or sluggish streams; distrib.; b. Graub. 5 . . . *vulgaris* L. 834.

37. Callitrichineæ.

191. Callitriche. Callitriche. XXI, 23. I, 2.

1. Ls dark green, always of the same form, linear, rather enlarged at the base, the pairs gen. close together, but the upper ones never rosetted.—Stagnant water; its presence in Switzerland is not yet proved with certainty. 7
* *autumnalis* L. 835.
- Ls light-green, entirely linear, with equal breadth, or more often enlarged above and narrower towards the base, the upper ones in an ordinary rosette, spathulate-obovate. Type of *C. verna* L. 2
2. Fr. broadly keeled (slightly winged). Styles of moderate length, erect or spreading, persist. Ls all obovate or (b. *platycarpa* Kütz.) the lower ones linear.—As the last; probably distrib. 5 . . . *stagnalis* Scop. 836.
- Fr. surrounded by a very narrow, sharp keel. Styles of moderate length, erect, persist. almost till maturity.—As the last. 5 . . . *vernalis* Kütz. 837.
- Fr. surrounded by a narrow, sharp keel. Styles very long, spreading, then reflexed, falling early.—As the last. 5
hamulata Kütz. 838.

38. Ceratophyllaceæ.

192. Ceratophyllum. Ceratophyll. XXI, 19.

- 1 Ls rather stiff, brittle, dark green, with 2—4 linear lobes which are strongly toothed-spinous. Fr. with a terminal spine which is as long as, or longer than, itself.—Stagnant water in the Swiss plains. 7 . . . *demersum* L. 839.
- Ls softer, light green, with 5—8 linear-filiform lobes, armed with distant, spinous teeth. Fr. terminated by a spine much shorter than the fr. itself.—As the last, but much rarer; T. W. V. J. B. Z. 7 . . . *submersum* L. 840.

39. Lythraceæ.

193. Lythrum. Lythrum. XI, 5. VI, 5.

1. Fls in whorls disposed in a long spike. Stas twice as many as the pets.—Var.: fls trimorphous, with styles of

3 different lengths; ls opp., or altern., or in whorls of 3; see N. Beitr. I, 12.—Moist places, ditches; distrib. 7

Salicária L. 841.

- Fls gen. solitary in the axils of almost all the ls. Stas as many as pets, or fewer.—Flooded places, rare; W. V. S. 6 **hyssopifolia L. 842.**

194. Peplis. Peplis. VI, 5.

1. Stem prostrate, rooting at the base. Ls opp., obovate, obtuse. Fls sessile in the l.-axils.—Submerged places, not common (wanting in G. U. A. Z. S.). 6 **Portula L. 834.**

40. Tamariscineæ.

195. Myricária. Myricária. XVI, 6.

1. Shrubs resembling the cypress. Ls small. Fls rose-coloured, in spikes.—Shores; fairly distrib. but not everywhere. 6 **germanica Desv. 844.**

41. Philadelphææ.

196. Philadelphus. Syringa. XII, 6.

1. Ls elliptic, denticulate. Fls white or yellowish white, having an almost unbearable perfume.—In shrubberies and sometimes subsponaneous. 5 . . . ***coronarius L. 845.**

42. Cucurbitaceæ.

197. Bryonia. Bryony. XXI, 31.

1. Fls diœcious. Stig. covered with rough hairs. Fr. red.—Hedges, thickets, not everywhere (wanting in U. L. A.). 5, 6 **dioica Jacq. 846.**
— Fls monœcious. Stig. glabr. Fr. black.—As the last. G. W. (Chur; Viège, Saxon). 5 **alba L. 847.**

OBS. Of this family the following are also cultivated: *Cucurbita Pepo L.* (the common gourd); *C. Melopepo L.*; *Cucumis sativus L.* (cucumber); and *C. Melo L.* (melon).

43. Portulacaceæ.

198. Portulaca. Purslane. XI, 5.

1. Cal.-lobes obtusely keeled on the back. Ls oblong-cuneiform. Stems and branches prostrate.—Rubbish-heaps, garden paths; fairly distrib. (wanting in U. L.). 6
oleracea L. 848.

- Cal.-lobes with winged-keels on the back. Ls obovate. Stem upright; branches ascending.—Cultivated and sometimes subsontaneous. 6 . . . † *sativa* Hav. 849.

199. Mántia. Mántia. III, 3, 79.

1. Seed rough with tubercles, almost dull. Stems rather stiff, erect or ascending, 3—10 *cm.* Ls yellowish green.—Submerged or damp sandy places; Tess., Geneva. 4
minor Gmel. 850.
- Seed very finely granulated and dotted, shining. Stem weak, floating in the water, up to 30 *cm.* Ls dark green.—Springs and brooks, rare; G. T. reported from Ruederthal, Canton Aarg.; more plentiful in the Black Forest and the Vosges. 7 . . . *rivularis* Gmel. 851.

44. Paronychiacææ.

200. Corrigiola. Corrigiole. V, 146.

1. Ls altern., linear-oblong. Stems spreading in a circle. Damp, sandy places, river gravel-beds; Bâle along the Wiese, Vevey? 6 . . . *littoralis* L. 852.

201. Herniária. Herniary. V, 59, 131.

1. Ls and cal. glabr.—Sandy places, road-sides; chiefly in western Switz. 6 . . . *glabra* L. 853.
- Ls and cal. covered all over with short thick hair; the hair which terminates the cal.-lobes longer than the others and setaceous.—As the last (wanting in G. A. U.). 6
hirsuta L. 854.
- Ls ciliate. Cal.-lobes covered with short, equal hairs.—High Alp.; G. W. 7 . . . *alpina* Vill. 855.

202. Illecebrum. Illecebrum. V, 59, 131.

1. Ls opp., obovate. Stems prostrate.—Inundated and damp sandy places; only found near Mendrisio in Tess. 6
verticillatum L. 856.

203. Telephium. Telephium. V, 146.

1. Ls altern., oval.—Rocky places; Lower Wall. 6
Imperati L. 857.

204. Polycarpon. Polycarp. III, 81.

1. Ls in whorls of 4, or opp., obovate.—Bâle on the Leonhardsgraben, between the paving-stones, adventitious or introduced. 6 . . . **tetraphyllum* L. 858.

45. Scleranthaceæ.

205. Scleranthus. Scleranth. V, 130. X, 29.

1. Cal.-lobes linear-oblong, obtuse, with a broad white-scarious edge. Perenn. pls.—Dry sandy places, hills, grassy places, not everywhere (wanting in G. B. A. U.).
5, 6 **perennis L. 859.**
- Cal.-lobes triangular-oval, or lanceolate, acute, with a narrow white edge or almost none. Ann. or bienn. pls **2**
2. Fl. small, $2\frac{1}{2}$ mm long. Cal.-lobes almost without scarious edges. Stems 3—8 cm.—Grassy places; W. V. 4, 5
verticillatus Tausch. 860.
- Fl. distinctly larger. Cal.-lobes with narrow, scarious edges **3**
3. Stem dichotomising loosely almost from the base upwards; fls solitary in the axils of the branches and clustered at the ends. Ann. pls.—Fields; distrib. 6
annuus L. 861.
- Stem gen. lower than in the last, simple or branching shortly only in the upper part. Clusters of fls sessile at the joints of the stem. Pls lasting through the winter, but monocarpic. S. biennis Reut.—Hills, mountain-fields; probably distrib. 4, 5 **collinus Horng. 862.**

OBS. Reichenbach, the father, has of late years distinguished a number of species which still require further investigation and verification: *e. g.* *S. suberinitus*, *spectabilis*, *Tabernaemontani*, *Sprengelii*, *engadineus*, *Delorti* Bill. &c.

46. Crassulaceæ.

206. Sedum. Stonecrop. X, 14. V, 148. XXII, 25.

1. Ls broad, flat **2**
- Ls narrow, cylindric or demi-cylindric **6**
2. Fls diœcious, gen. 4-merous, yellowish, tinted with red. Ls standing very close, toothed towards the top. *Rhodiola rosea* L.—Alp.; G. T. W. 7 **Rhodiola Dec. 863.**
- Fls hermaphrodite, gen. 5-merous **3**
3. Ann. pls. Fls in a lax panicle.—Stony, thickety places; T. W. V. 6 **Cepæa L. 864.**
- Perenn. pls. Fls in a compact corymb **4**
4. Ls entire. Stem prostrate, 20 cm long,—Alp.; W. V. 7
Anacampseros L. 865.
- Ls toothed. Stems erect or ascending, 40—60 cm. Type of *S. Telephium* L. **5**
5. Pets greenish-yellow. Ls often opp. or in whorls of 3. the upper ones with rather broad base, often clasping,

—Stony, thickety places, slopes, road- and wood-sides; fairly distrib. (wanting in U. L.). 8 **maximum** Sut. 866.

- Fls rose-coloured or purple. Ls most often altern., the upper ones rounded at the base, slightly cuneiform.— As the last; distrib. (wanting in W.). 7

purpurascens Koch. 867. *)

- 6 (1). Stas equal to pets in number, viz. 5. Ann. pl., gen. tinted with red, glandular in the upper part. *Crassula rubens* L.—Vineyards, fields, rare; V. Bâle, Eglisau, Zofingen. 6 **rubens** L. 868.
- Stas twice as many as pets 7
7. Ann. or bienn. pls (rarely in 870 with solitary shoots not bearing fls) 8
- Perenn. pls with tufted stems not bearing fls 11
8. Pets gen. 6, almost 4 times as long as the cal., white, with a reddish middle nerve. Ls of a bluish-green. *S. glaucum* W. K.—Walls, road-sides; L. U. A. (Central and eastern Switz.). 7 **hispanicum** L. 869.
- Pets 5, more rarely 6, 2—3 times as long as the cal. 9
9. Pl. pubescent-glandular (rarely glabr.). Pets rose-coloured, with a darker middle nerve.—Marshy fields and peat-moss, up to the Alp. (wanting T. S. J.). 6 **villosum** L. 870.
- Pl. glabr. 10
10. Pets whitish, with a greenish middle nerve. Ls club-shaped. Pl. 3—6 cm (gen. tinted with reddish-brown, rarely pale yellow). Corymb compact; fls pedicelled.—Alp., subalp. and Jura. 7 **atratum** L. 871.
- Pets yellow Ls cylindric-linear. Pl. 7—12 cm. Branches of the corymb elongated (spike-shaped), bearing almost sessile fls.—Granite Alp.; not everywhere. 7 **annuum** L. 872.
- 11 (7). Fls white or rose-coloured. (Anthers brown) . . . 12
- Fls yellow. (Pl. glabr.) 13
12. Ls linear-cylindric, altern. Inflorescence glabr.—Rocks; walls, everywhere. 7 **album** L. 873. *)
- Ls short elliptic, humped, often spotted with red, and mostly opp. Inflorescence glandular.—As the last; fairly distrib. 7 **dasyphyllum** L. 874.
13. Ls obtuse. Pl. of 3—8 cm 14
- Ls short—cuspidate. Pl. of 15—25 cm 16
14. Pets erect, obtuse. Fls only. 2—3—5 in number, pale yellow and smaller than in the two following. *S. repens* Schleich.—Alp., not common; G. W. O. U. A. 7

alpestre Vill. 875.

*) A form with smaller, darker ls and stas inserted rather higher (?) (**S. purpureum** Tausch? *Fabaria* auct. helv. not Koch) near Courlevon.

) **S. micranthum Bast., smaller, with shorter ls which are almost upright on the barren shoots, according to Gren., in the Jura, according to Dur. and Pitt. on the Alp. of Canton Vaud.

- Pets spreading, acute **15**
15. Ls linear-cylindric, prolonged at the base in a sort of spur which reaches below the point of insertion, not bitter to the taste. *S. boloniense* Loisl.—Walls, hills with short grass; distrib. 6, 7 . **sexangulare** L. 876.
- Ls oval, thick, without a spur at the base, with a bitter flavour. Fls less numerous than in the last.—As the last, and often confounded with it, but rather earlier **acre** L. 877.
- 16 (13). Pets spreading, bright yellow.—Var.: Pl. glaucous or (v. *reflexum* L.) of a bright green.—Dry, stony places, but not everywhere (wanting in L. U.). 7 **rupestre** L. 878.)*
- Pets erect, pale yellow. *S. anopetalum* Dec.—As the last; Veyrier, not far from Geneva, formerly also near Lausanne. 7 ***ochroleucum** Chaix. 879.

207. *Sempervivum*. House-leek. XI, 1.

1. Pets rose-coloured or lilac **2**
- Pets yellow or yellowish white **6**
2. Ls of the rosettes pubescent-glandular on both sides **3**
- Ls of the rosettes glabrous above or warty-glandular **5**
3. Ls of the rosettes bound together at the top by long, soft hairs, like a spider's web.—d. *Dællianum* Lehm. Spider's-web hairs fewer, rosettes smaller. (Binnthal, Bernese Oberland.)—c. *tomentosum* Schnittsp. Webby indumentum very dense, white (Wall.).—Alp. and subalp., descending to the valleys. 7 . **arachnoideum** L. 880.
- Ls of the rosettes not bound together by webbed hairs **4**
4. Ls of the rosettes long-ciliate, ciliæ much longer than the glandiferous hairs.—Alp.; reported from the Parpaner Rothhorn in Graub.; Binnthal and Gemeinalp in Wall. 7 **Funckii** Braun. 881.
- Ls of the rosettes with short ciliæ, the ciliæ scarcely longer than the glandiferous hairs.—Alp. 7 **montanum** L. 882.
- 5 (2). Ls of the rosettes with rather stiff ciliæ at the edges, glabr. at the point. *S. juratense* Jord.—Rocky places, especially of the mountains and Alps, also cultivated on roofs and walls 7 . . . **tectorum** L. 883.**))

*) *S. arrigens* Gren. Pl. green, inflorescence erect before flowering, not reflexed, according to Gren. Colombier de Gex, Reculet.

*) The following are probably allied to this species: **S. Schnittspahnii** Lagg., **glaucum** Ten. (*acuminatum* Schott?), **valesiacum** Lehm., and **Mettenianum** Lehm. Schn.—**S. alpinum** Griseb., differing in the hairy caul. Ls, longer pets, ciliæ at the edges, of a fine rose-colour, in Graub. (Engadine, Ave. s, Rheinwald, Bernhardin) according to Brugg., and in Tessin (Val Maggia) according to Christ.

- Ls of the rosettes warty-glandular above, edged with long, white, flexible hairs which form a small tuft at the end of the leaf. Pets larger and broader than in *S. arachnoideum*.—*Récullet* in the Jura. 8

Fauconneti Reut. 884.

- 6 (1). Ls of the rosettes glaucous, glabr. above.—Alp.; G. (Engadine, Poschiavo). 7 *Wulfeni* Hopp. 885.

- Ls of the rosettes pubescent-glandular above . 7

7. Pets almost 3 times as long as cal.-lobes. Rosettes large. *S. globiferum* Gaud. Pittoni Schott?—Alp.; W. (Zwischbergen!) Cogne, Val Tormanche. 7 *Gaudini* Christ. 886.

- Pets at most twice as long as cal.-lobes. Rosettes small.—Alp., reported from Camogask, Graub. 7

Braunii Funk. 887.

OBS. During the last few years still a large number of species have been established which have yet need of final examination; See Beitr., 74 and B. S. M. II, 32 and 49.—Hybrids: *alp.-arachnoideum*; *alp.-montanum*; *arachnoid.-montanum* (*barbulatum* Schott, *piliferum* Jord.); *arachn.-tectorum* (Fontanæ Brügg.) *montan.-Wulfeni* (Huteri Kern.); *tectorum-Wulfeni* (Comollii Rota).

47. Cactaceæ.

208. *Opuntia*. *Opuntia*. XII, 3.

1. Pls leafless, fleshy, jointed, prickly. Fl. of a sulphur yellow. *O. nana* Vis.—Rocky places; near Sion (Valère), at least naturalised. 6 *vulgaris* Mill. 888.

48. Grossulariaceæ.

209. *Ribes*. *Ribes*. V, 5. XXII, 10.

1. Prickly shrubs. Racemes 1—3-fld. Gooseberry.—Uncultivated, stony, thickety places; hedges; also cultivated. *) 4 *uva crispa* L. 889.
- Shrubs without prickles. Racemes many-fld. (in 890 the fem. racemes only 2—5-fld) 2
2. Racemes erect. Fls imperfectly diœcious. Bracts lanceolate, longer than the pedicels. Ls shining underneath, smaller and more shortly petioled than in the species which follow.—Mountain woods; distrib. 5 *alpinum* L. 890.
- Racemes pendant at any rate after flowering. Fls hermaphrodite. Bracts oval, gen. shorter than the pedicels 3
3. Ls dotted underneath with yellowish glands. Fr. black, of a peculiar flavour. Black-currant.—Water-side; rare; G. V. (Payerne); often cultivated. 4 *nigrum* L. 891.

*) *R. Grossularia* L, the form with larger fr., covered with setaceous glandiferous hairs, is only cultivated with us.

- Ls without glands. Fr. red, acid or bitter 4
- 4. Cal.-tube wide cup-shaped; cal.-lobes not ciliate. Red-
or white-currant.—Cultivated and sometimes subspont-
aneous. 4 † *rubrum* L. 892.
- Cal.-tube campanulate; cal.-lobes ciliate; l.-divisions more
acute than in the last.—Fls reddish. Fr. larger and later.
—Alp., subalp. and Jura; also cultivated and then the
fls less coloured). 4, 5 *petræum* Wulf. 893.

49. Saxifragaceæ.

210. *Saxifraga*. Saxifrage. X, 12.

1. Ls having at the edges, or at least at the top, chalk-
secreting pits. (Ls entire) 2
- Ls without chalk-secreting pits or in 908 and 909 with,
even when young, a small dimple, without the chalky
scale 12
2. Cauline ls opp. Fls rose or lilac 3
- Caul. ls altern. Fls white (sometimes spotted with red)
or yellow 7
3. Cal.-lobes with glabr. edges. Ls with 3—5 spots at the
triangular tip.—Alp.; on the southern side of Mont Rosa. 7
* *retusa* Gouan. 894.
- Cal.-lobes ciliate. Ls with 1 spot (rarely 3) at the tip 4
4. Fls solitary; ring-shaped disk 0 or very narrow. Ls
crowded. Type of *S. oppositifolia* 5
- Fls 2—5 (—9); ring-shaped disk fairly broad. Ls rather
distant. Type of *S. biflora* 6
5. Cilix of the cal.-lobes not glandiferous.—Debris of the
Alp. and higher peaks of the Jura (Reculet and Dent de
Vaulion); brought down by water to the shores of the
Lake near Constance. 6 *oppositifolia* L. 895.
- Cilix of the cal.-lobes glandiferous. Pl. more cæspitose
than the last. Ls shorter.—High Alp; G. W. O. 7
Rudolphiana Hornsch. 896.
6. Pets lanceolate, 3-nerved. *S. Hornungii* Shuttlw.—Debris
of the Alp. 7 *biflora* All. 897.
- Pets broad elliptic, 5-nerved. Fls larger than in the last.
S. macropetala Kern.—As the last and confounded with
it; the localities of the 2 species have yet to be verified. 7
Kochii Horng. 898.
- 7 (2). Ls ligulate, toothed, surrounded by a line of pores.
Stem 15—60 cm 8
- Ls almost 3-cornered, entire, with 5—7 pores. Stem
5—12 cm 10

8. Pets of an orange-yellow (rarely yellow).—Damp rocks of the mount. and subalp., from St. Gall to the Lake of Thun; Calanda, Lägern, Rüdlingen on the Rhine; wanting in the central and southern Alp. and the Jura. 7
mutata L. 899
- Pets white or yellowish white, often spotted with red 9
9. Lateral branches of the panicle 5—20-fld. Stem 30—60 cm. —Granite rocks, especially of transalpine Switz., U., rarer in the other Alps, W. O. 6 . . . *Cotylédon* L. 900.
- Lateral branches of the panicle or raceme 1—4-fld. Stem 15—30 cm.—b. *brevifolia* Sternb. (intacta Willd.) Ls shorter, broader, pets not dotted.—Rocks of the Alp., subalp. and Jura, to the foot of the mount. 6
Aizoon L. 901.
- 10 (7). Ls oval-lanceolate, cuspidate, with 5. pores.—Alp.; Veltlin, between Livigno and S. Giacomo di Fräle, not far from the frontiers of Graub. 6 * *Vandellii* Sternb. 902
- Ls linear-oblong or linear-lanceolate, obtuse, sometimes shortly-mucronate, or pointed, with 7 pores . . . 11
11. Stem densely glandular-viscid. Ls erect or slightly bent back towards the top.—Alp.; W. (Pierre à voir, Bagne). 6
diapensoides Bell. 903.
- Stem glabr. or with scattered glandular hairs. Ls bent back almost from the base in an arch.—Calc. rocks of the Alp. 7 *cæsia* L. 904.
- 12 (1). Cilix of the ls not jointed 13
- Cilix of the ls jointed or in 910 not jointed at the base of the leaf 17
13. Stem leafless. Ls obovate-cuneiform, toothed at the top. Pets white with 2 yellow spots.—b. *robusta* Engl. (S. Clusii auct. helv. not Gouan.) Pets unequal, 3 of them rather broader, suddenly narrowed to a claw.—Damp places of the Alp. 7. *stellaris* L. 905.
- Stem leafy. Ls lanceolate or linear 14
14. Pets with 2 hard spots at the base, golden yellow. Ls lanceolate.—Peat-moss; in many parts of the central Jura: Surenenpass, Vevey (at least formerly), near Einsiedeln. 7
Hirculus L. 906.
- Pets without hard spots 15
15. Ls bearing foliaceous buds in their axils. Ovary free, superior. Pets yellowish white. Type of *S. aspera* 16
- Ls without foliaceous buds in their axils. Ovary half-inf. Pets light or dark yellow, sometimes (v. *atrorubens*) saffron yellow.—Damp places of the Alp. and subalp.; brought down sometimes by torrents; Reculet and Colombier in the Jura. 7 *aizoides* L. 907.

16. The foliaceous buds half as long as the leaves which support them. Stem 10—15 *cm*; many- (3—7-) fld.—Rocks of Alp. and subalp. 7 **áspera** L. 908.
- The foliaceous buds as long as the ls which support them. Stem 5 *cm*, gen. 1-fld.—High Alp. 8 **bryoides** L. 909.
- 17 (12). Rt.-stock with barren shoots. High mountain pls **18**
- Rt. or rt.-stock without barren shoots **25**
18. Stas dilated towards the top. Ls glabr., roundish ob-ovate, surrounded by a cartilaginous rim. Stem leafless. Pets white, with, rarely without, a yellow spot.—Alp.; descending to the Rhone valley. 6 **cuneifolia** L. 910.
- Stas subulate. Pls often pubescent-glandular **19**
19. Lower ls palmatifid, with 3—5—9 lobes, sometimes mixed with entire ls (rarely in 914 all entire) **20**
- Ls all entire, rarely, in 915 and 916, 3-toothed at the top **23**
20. Pets narrow linear, acute, only $\frac{1}{3}$ the breadth of the cal.-lobes and barely longer, lemon-yellow. Stem 1-fld. *S. aphylla* Sternb.—High Alp.; G. U. A. O. (Foot of the Rothstock); not found any farther west. **stenopétala** Gaud. 911.
- Pets oval, oblong or obovate, obtuse. Stem 2—12- (rarely 1-) fld **21**
21. Pets narrowed to a distinct claw. Style much longer than the stig. Cal.-lobes almost linear. Fls large.—Alp.; southern side of Mont Rosa. 7 ***pedemontana** All. 912.
- Pets with no claw. Style about 2 or 3 times as long as the stig. Cal.-lobes oval or oval-oblong **22**
22. Ls with 3—5 furrows when fresh, when dry with 3—5 prominent nerves. Pets gen. twice as long as the cal.-lobes, white or yellowish, rarely spotted with red, or almost entirely red (*v. maculata* Rehb. *Albula*). *S. cæspitosa* Gaud. not L., *intermedia* Gaud., *leucantha* Thom., *striata* Hall. f.?—High Alp., fairly distrib.; descending almost to the valley in Wall. 7 **exarata** Vill. 913.
- Ls when fresh without furrows, when dry with a few nerves. Pets as long as, or barely longer than, the cal.-lobes, greenish yellow, rarely almost white, very rarely of a dark red (*v. atropurpurea* Sternb.) *S. muscoides* auct. not All., *moschata* Gren. Engl., *acaulis* Gaud. (*f. compacta*), *crocea* Gaud. (fl. of a saffron yellow; according to Koch, on Mont Rosa).—Alp. and Jura (Reculet, Colombier). 7 **variens** Sieb. 914.
- 23 (19). Ls linear-oblong, round-obtuse at the top; those of the preceeding years whitish gray at the top. Stems 2—5-fld. Pets white, becoming yellow in drying (with pets of a lemon-yellow, *v. citrina* Heg., reported from

- near Zermatt), obovate-oval, twice as long as the callobes. *S. muscoides* All. — High Alp. 7 **planifolia** Lap. 915.
- Ls spatulate-lanceolate or obovate, those of former years brown. Stem, not considering bracts, leafless or with one leaf 24
24. Pets white, even when dried, obovate. Almost twice as long as the callobes.—High Alp.; rather rare. 7
androsacea L. 916.
- Pets yellow, oblong-linear, as long as, or barely longer than, the callobes.—High Alp.; fairly rare. 7
Seguieri Sprgl. 917.
- 25 (17). Ann. pls 5—15 cm high. Ls 3—5-toothed, or 3—5-fid, rarely entire. (Pls glandular-glutinous; fls white) 26
— Perenn. pls, 20—50 cm high. Ls lobed-crenate . . . 27
26. Pedicels much longer than the fr.-calyx.—Gravelly places, walls, sunny grass-plots; fairly distrib. 3, 4
tridactylites L. 918.
- Pedicels, at most, as long as the fr.-calyx. Stem more robust and more leafy than in the last. Fls larger. *S. petræa* Gaud.—Alp.; G. W. V. 7 **controversa** Sternb. 919.
27. Rt. or l.-axils bearing little bulbs. Pets white . . . 28
— Without the little bulbs. Pets white, spotted with yellow and red. Ls cordate—reniform.—Damp, shady places of the Alp., subalp. and Jura. 6 . . . **rotundifolia** L. 920.
28. Stem always 1-fld. The axils of the upper ls bearing small bulbs. Ovary sup.—Under overhanging, damp rocks, damp places (above Lens, Sanetsch). 7
cérnua L. 921.
- Stem 3—9-fld. Ovary half-inferior 29
29. Stem furnished with ls throughout its whole length (8—12 ls). Axils of the upper ls bearing small bulbs. —Grassy slopes; W. (Sion, Branson, Gueuroz). 7
bulbifera L. 922.
- Stem only leafy in its lower part (3—5 ls). Axils of the ls without small bulbs.—Grassy hills and slopes of northern Switz.; Murg on the Wallensee; Lausanne and Geneva. 4 **granulata** L. 923.

OBS. Hybrids: *S. aizoides-cæsia* (patens Gaud.); *S. aizoides-mutata* (Hausmanni and Regelii Kern., Girtanneri Brügg.); *S. Aizoon-Cotyledon* (Gaudini Brügg. Simplon); *S. androsacea-equieri*; *S. biflora-oppositifolia* (hybrida Kern.); *S. Cotyledon-cuneifolia* (Jäggiana Brügg.! Roffla); *S. planifolia-stenopetala* (Mureti Ramb.); *S. planifolia-varians*.

211. *Chrysosplenium*. *Chrysosplene*. VIII, 21. X, 28.

1. Caul. ls altern., rad. ls orbicular-reniform.—Damp, shady places, near springs; distrib. 4 . . . **alternifolium** L. 924.

- Caul. ls opp., rad. ls almost semi-orbicular (truncate at the base).—As the last but much rarer, chiefly in central Switz. (B. J. U. L.). 4 . *oppositifolium* L. 925.

50. Umbelliferæ.

212. *Hydrocótyle*. *Hydrocótyle*. V, 65.

1. Stem creeping. Ls peltate-orbicular, crenate.—Marshes, here and there (wanting in G. T.). 6, 7 *vulgaris* L. 926.

213. *Sanicula*. *Sanicle*. V, 66.

1. Rad. ls palmatipartite, with 3-fid divisions, inciso-dentate.—Shady woods; distrib. 5 . . . *europæa* L. 927.

214. *Astrántia*. *Astrantia*. V, 66.

1. Rad. ls palmatisect, with narrow, lanceolate divisions.—Alp. and subalp. 6, 7 . . . *minor* L. 928.
— Rad. ls palmatipartite, with oblong-obovate divisions.—Mount. and subalp. 6 . . . *major* L. 929. *)

215. *Eryngium*. *Eringo*. V, 64.

1. Rad. ls undiv. Heads oblong, of an amethyst blue.—Alp.; G. W. V. B. U. (mostly in western Switz.); Re-culet and Colombier in the Jura. 7 *alpinum* L. 930.
— Ls ternate-bipinnatifid. Heads almost globular, of a whitish green.—Slopes, road-sides; not common; western Switz. T. 7 . . . *campestre* L. 931.

216. *Cicúta*. *Cowbane*. V, 101.

1. Ls 3-pinnatisect with narrow, linear-lanceolate, dentate-mucronate, segments. Rt.-stock hollow, div. into superposed cells.—Marsh-ditches; water side; rather rare (wanting in G. T. S.). 7 . . . *virosa* L. 932.

217. *Petroselinum*. *Parsley*. V, 74.

1. Ls shining above, the lower ones 2—3-pinnatisect, with lanceolate segments. Fls greenish. Cultivated. 6
† *sativum* Hoffm. 933.

218. *Trinia*. *Trinia*. V, 68.

1. Ls 2—3-pinnatisect, with linear segments. T. *glauca* Dumort. T. *elatior* Gaud.?—Dry, stony places, hills; G. T. W. V. B. O. 5 . . . *vulgaris* Dec. 934.

*) *A. alpina* F. Schultz (carniolica Koch p. not Wulff.) reported from the Seeboden in Weissstannenthal and in the Lower Engadine. See N. Beitr. II, 7.

219. *Apium. Celery.* V, 81.

1. Ls pinnatisect, with cuneiform segments, incised in front. Umbels very shortly peduncled. 7. Cultivated
† *graveolens* L. 935.

220. *Helosciádium. Helosciádium.* V, 119, 98.

1. Stem prostrate throughout its whole length, and rooting. L.-segments oval. Umbels peduncled.—Marsh-ditches; rare (wanting in G. W. J. L.). 7 . *repens* Koch. 936.
— Stem prostrate and rooting only at the base. L.-segments oval-lanceolate. Umbels almost sessile. (*Berula* is distinguished by its many-leafed invol.).—As the last; W.? V. 7 *nodiflorum* Koch. 937.

221. *Ptychotis. Ptychotis.* V, 103.

1. Rad. ls simply pinnatisect, with almost orbicular, incised-dentate segments. Caul. ls multifid, with linear-filiform divisions.—Gravelly places by the Lake of Geneva. 7
heterophylla Koch. 938.

222. *Falcária. Falcária.* V, 121.

1. Ls 1—2-ternatisect; segments long, linear-lanceolate, slightly coriaceous, with a cartilaginous edge and serrate teeth. F. Rivini Host.—Fields, road-sides; rare; J. Z. S. 7
vulgaris Bernh. 939.

223. *Sison. Sison.* V, 83, 103.

1. Ls pinnatisect; segments of the lower ls oval-oblong, those of the upper ls pinnatifid, with linear lobes.—Shady places, hedges; Geneva. 7 . *Amomum* L. 940.

224. *Ammi. Bull-wort.* V, 121.

1. Ls simply or 2—3-ternatisect, of a bright or glaucous green, glabr.—Lucern-fields; introduced with foreign grain; J. Z. S. 7, 8 *majus* L. 941.

225. *Aegopódium. Gout-weed.* V, 82.

1. Rad. ls ternatisect, with large, oval-oblong, unequally toothed segments.—Shady places, walls, hedges; everywhere. 6 *Podagraria* L. 942.

226. *Carum. Caraway.* V, 85, 121.

1. Invol. 0; involucel 0 or of few leaflets. Rt. fusiform. Caraway.—Fields, pasturages; everywhere. 5 *Carvi* L. 943.
— Invol and involucel of 4—7 leaflets. Rt. globular. *Bunium* Bulboc. L.—Fields; W. V. B. J. (western Switz.). 6
Bulbocastanum Koch. 944.

227. **Pimpinella. Burnet-saxifrage.** V, 84.

1. Stem angular, furrowed, ls few, distant, 6—12 *dm.*—Var. with l.-segments pinnatifid (v. *orientalis* Jacq.), and, especially in the subalp., with rose-coloured fls (v. *rubra* Hoppe).—Meadows, woods; everywhere. 5 **magna** L. 945.
- Stem cylindric, finely streaked, almost without ls in the upper part.—Var.: segments, of the rad. ls also, lacinate (v. *hircina* Mönch);—b. *nigra* Willd. Pl. very pubescent; rt. of a blue colour when cut.—c. *alpestris* Sprgl. See N. Beitr. II, 7.—Dry pasturages, hills, slopes; b. Wall. 7 **Saxifraga** L. 946.

OBS. *P. Anisum* L. is cultivated, but only rarely.

228. **Bérula. Bérula.** V, 122 a.

1. Ls pinnatisect; segments oval-lanceolate, irreg. incisedentate. Stem 40—60 *cm.*, cylindric, finely streaked.—Ditches and brooks; everywhere. 7 **angustifolia** Koch. 947.

229. **Sium. Sium.** V, 122 a.

1. Ls pinnatisect; segments finely and reg. toothed. Stem 100—150 *cm.*—Ditches; W.? V. B. J. (western Switz.). 7 **latifolium** L. 948.

OBS. *S. Sisarum* L. with tuberculous-fascicled root, is cultivated, but rarely.

230. **Bupleurum. Hare's-ear.** V, 67.

1. Ls perfoliate, oval. Ann. pls. Umbels with 5—8 rays. —Fields (wanting in T. U. L). 6. **rotundifolium** L. 949.
- Ls not perfoliate. Perenn. pls 2
2. Involucel-leaflets united from the base to the middle. Stem leafless or with one l. in its upper part. Ls linear-lanceolate.—Alp.; G. T. W. O. U. 7 **stellatum** L. 950.
- Involucel-leaflets free 3
3. Ls 1-nerved, but with numerous reticulate veins, the upper ones oblong or oval, deeply cordate. Involucel-leaflets broad, elliptic.—Thickets; Jura as far as Schaffh.; Schwyz and Zürich (along the Sihl); Speer and Rüti, Canton St. Gall. 7 **longifolium** L. 951.
- Ls several-nerved, without reticulate veins, or rarely having such veins, but then involucel-leaflets linear-lanceolate 4
4. Ls surrounded by a narrow membranous edge, the upper narrower than the lower, linear or linear-lanceolate, narrowed towards the base, often rather bent in the shape of a sickle. Involucel-leaflets narrow, lanceolate.—Dry hills. Western Switz. W. S. 8 **falcatum** L. 952.

- Ls without the membranous edge, the upper ones broader, clasping at the base. Involucel-leaflets broad, elliptic. *B. Burserianum* Schl. (larger form).—*b. canalense* Wulf. (*caricifolium* Rehb. not Willd.) Stem often taller and more branched; ls only 2—3 mm broad; umbellules and especially the involucels smaller. Probably a good species! —Alp. and Jura; *b.* Monte Salvatore in Tess. 7
ranunculoides L. 953.

231. *Oenanthe*. *Oenanth.* V, 105.

1. Rt. fusiform. Ls 2—3-pinnatisect, with very numerous, small and spreading segments. Fls all pedicelled and fertile.—Marsh-ditches, rare; Freibg., Neuchâtel, Aargau, Schaffh. (Binningerried). 7 . *Phellandrium* Lam. 954.
- Rt. fascicled. Ls 1—3-pinnatisect, the cauline with long, linear segments. Fls of the circumference pedicelled, often sterile, those of the centre almost sessile, fertile 2
2. The pinnatisect portion of the caul. ls shorter than the hollow petiole. Umbels with 2—4 (the lateral, later ones with 3—6) rays.—Marshy meadows, ditches, rare and almost only on the plains of western Switz. 6
fistulosa L. 955.
- The pinnatisect portion of the caul. ls longer than the petiole. Umbels with 8—15 rays. Rt.-fibres tuberculous, long-clavate, thickened in the middle or towards the end. —Marshy meadows, rare; T. V. Lower Wall., Bâle, Lake of Zürich (at least formerly). 6
Lachenalii Gmel. 956. *)

232. *Aethusa*. *Aethusa.* V, 104.

1. Ls 2—3-pinnatisect, entirely glabr., shining underneath, and emitting a foetid smell when rubbed. Stem 20—45 cm, among stubble, only 2—8 cm (*v. agrestis*), on the rich soil of woods often 120—150 cm (*v. elata*). Very easily recognised by the 3 long leaflets of the involucel being bent back and turned downwards!—Distrib. 6
Cynapium L. 957.

233. *Foeniculum*. *Fennel.* V, 71.

1. Ls several times pinnatisect, with long, linear-filiform segments. Sheaths of the upper ls 30—50 mm long (comp. *Anethum*).—Stony places, vineyards, road-sides; here and there, especially in western Switz. 7
officinale All. 958.

*) *O. peucedanifolia* Poll., a W. European species, differs in its napi-form rt.-fibres which are oval or elongated, sessile, thickened from the base and terminated by a long fibre, in its umbels of 6—10 rays, longer styles and earlier bloom. This species is not found in this country.

234. *Séseli*. *Séseli*. V, 90, 108.

1. Invol. many-leafed. Ls 2—3-pinnatisect, bluish green underneath. Stem 40—100 *cm*, in the Alps only 12—15 *cm*. *Libanotis montana* Crantz.—*b. daucifolium* Scop. Ls more div., with narrower segments. (Simplon! Binnthal) — Stony mount. slopes, on calcareous soil; distrib. 7
Libanótis Koch. 959.
- Invol. 0 2
2. Umbels with 6—10 rays. Involucel-leaflets with very narrow membranous edges.—Calc. hills. Pruntrut. 8
montanum L. 960.
- Umbels with 15—30 rays. Involucel-leaflets with broad membranous edges. *S. coloratum* Ehrh.—Hills, wood-edges; here and there; G. W. V. B. J. Z. S. A. 8
annuum L. 961.

235. *Cnidium*. *Cnidium*. V, 108.

1. Ls 3-pinnatisect. L.-sheaths loose, standing out from the stem. *Ligusticum silaifolium* Gaud.—T. (Mt. Generoso). 7
apioides Sprgl. 962.

236. *Trochiscanthes*. *Trochiscanthes*. V, 98.

1. Ls several times ternatisect; segments large, oval-lanceolate, unequally toothed. Fl.-branches opp. or whorled, with numerous small umbellules. — Wooded places; lower Rhone valley (Aigle, Epenassay and Port-Wall). 7
nodiflorus Koch. 963.

237. *Athamanta*. *Athamanta*. V, 90.

1. Ls 3-pinnatisect, with linear segments, more or less gray-pubescent or, especially in lower stations, almost glabr. (*v. rupestris* Vill.). — Calc. rocks of Alp., subalp. and Jura. 6 *crétensis* L. 964.

238. *Ligusticum*. *Lovage*. V, 85, 107, 122.

1. Invol.-leaflets 0—3, undiv. Stem 100 *cm* and more.—T. (Mt. Generoso). 7 *Seguieri* Gaud. 965.
- Invol.-leaflets numerous, pinnatifid towards the top. Stem 30—50 *cm*.—Detritus of the Jura (Recullet, Colombier). 7
**ferulaceum* All. 966.

239. *Silaus*. *Silaus*. V, 75.

1. Ls 2—3-pinnatisect, with linear-lanceolate segments, entire and rough at the edges.—Damp meadows; distrib. 7
pratensis Bess. 967.

240. Meum. Spignel. V, 107.

1. L.-segments multifid, with capillary, almost whorled lobes.—Pasturages in the mount. and Alp., rare; St. Bernhard, Jura of Canton Neuchâtel, Etzel and Einsiedeln. 5—7
athamanticum Jacq. 968.
- L.-segments pinnatifid, with linear-lanceolate segments.—Alp. 6 *Mutellina* Gärtn. 969.

241. Pachypleurum. Pachypleurum. V, 117.

1. Ls 2—3-pinnatisect, with linear segments. Invol.-leaflets 7—10, gen. 2—3-fid. Fr. often tinted with dark violet. No. 969 which resembles it, differs in the want of invol. or invol. consisting of only one leaflet. *Gaya simplex* Gaud.—High Alps. 7 *simplex* Rchb. 970.

242. Selinum. Milk-parsley. V, 110.

1. Ls 3-pinnatisect; segments deeply pinnatifid, with divisions terminated by a white, mucronate point. Stem angular, almost winged. No. 981 which resembles it, differs in the numerous invol.-leaflets, edged with white. —Damp meadows, marshes; here and there. 7
carvifolium L. 971.

243. Levisticum. Heart-wort. V, 76.

1. Ls (like those of the celery) shining, 2-pinnatisect; segments rhomboidal-cuneiform, inciso-lobed in front.—Cultivated in cottage-gardens. 7 † *officinale* Koch. 972.

244. Angélica. Angélica. V, 111.

1. Ls 3-pinnatisect; segments oval or oval-lanceolate, unequally toothed.—b. *montana* Schleich. Pl. often taller; l.-segments narrower, the upper decurrent at the base. —Meadow-ditches, damp thickets; distrib.; b. chiefly in mountainous parts. 7 *sylvestris* L. 973.

245. Archangélica. Archangel. V, 111.

1. Habit of the last, but l.-sheaths entirely united to the stem, and fls greenish —Rarely cultivated; reported also as subsontaneous by the water-side. 7
† *officinalis* Hoffm. 974.

246. Peucedanum. Hog's Fennel. V, 72, 80, 112, 118.

1. Invol. 0 or of few (-3) leaflets 2
- Invol. of 4—many leaflets. (Ls 3-pinnatisect) 5
2. Stem 10—25 dm high, much-branched; upper branches whorled. Ls 3-pinnatisect; segments oval, coarsely toothed.

Fl. greenish yellow. Habit of an Angelica. *Tommasinia verticillaris* Bert.—Mountain slopes. G. 7

verticillare Koch. 975.

- Stem 3—10 dm, simple or branches not whorled. **3**
- 3. Ls simply pinnatisect; segments sessile, pinnatifid, with linear lobes. Fls greenish or yellowish. *P. carvi-folia* Vill.—Wood-sides, thickets; along the Jura from Geneva to Bâle; Martigny? 7 **Chabræi Rchb. 976.**
- Ls 1—2-ternatisect; segments oval or oblong, 2—3-fid. Fls white or rose-coloured **4**
- 4. Ls (resembling those of *Aegopodium*) rather stiff; segments oval, unequally toothed. *Imperatoria* Ostr. L.—Alp. 6 **Ostruthium Koch. 977.**
- Ls thin, 2-ternatisect; segments cuneiform, long-acuminate, unequally and deeply inciso-dentate, pinnatifid at the base, lobes and teeth directed forwards, acuminate.—Tess. (in monte supra Lugano et Bironico; Schleich. herb !). 6 **angustifolium Rchb. f. 978.**
- 5 (1). Edges of the carps winged, thin, as broad as the whole carp. (Stem furrowed, with ridges of a shining white). Type of *P. austriacum* **6**
- Edges of carps narrow, at most half as wide as the carp. **7**
- 6. L-lobes linear-lanceolate. *Selinum nigricans* Gaud.—Stony, thickety hills and mountains of western Switz. W. V. O. 7 **austriacum Koch. 979.**
- L-lobes narrow-linear.—As the last. Italian Switz. 7 **raiblense Koch. 980.**
- 7. Rt.-stock not surrounded by the remnants of the ls of former years. Stem hollow, furrowed. Vittæ of the commissural-face covered. Comp. *Selinum*. *Thysselinum palustre* Hoffm.—Damp meadows; distrib. 7, 8 **palustre Mönch. 981.**
- Rt.-stock surrounded by the remains of the ls of former years. Stem gen. solid. Vittæ visible **8**
- 8. Stem angular, furrowed, branched in the upper portion, with rather small opp. or whorled umbels. Invol. spreading. L-divisions linear-lanceolate.—Stony mountains; T. W. 8 **venetum Koch. 982.**
- Stem cylindric, streaked or slightly furrowed in the upper portion, simple or rather branchy, with large umbels **9**
- 9. Ramifications of the petiole bent back at a right or obtuse angle. L-segments green underneath or slightly paler, oblong-cuneiform, incised or almost pinnatifid. Full-grown fr. almost orbicular, indented at the top. Vittæ of the commissural face arched, skirting the

edge.—Dry hills, wood-sides; fairly distrib. (wanting in U. L. A.). 7 . . . **Oresselinum** Mönch. 983.

- Ramifications of the petiole spreading at an acute angle. L.-segments rather coriaceous, grayish-green underneath, oval, serrate, with almost mucronate teeth. Fr. oval, not indented. Vittæ of the commissural face almost parallel.—As the last (wanting in A.). 7 **Cervária** Cuss. 984.

247. *Anéthum*. Dill. V, 73.

1. Resembling fennel, from which it is distinguished by the flat, lentil-like fr., and the shorter (only 10—15 mm long) sheaths.—Cultivated. 7 . . . † **gravéolens** L. 985.

248. *Pastinaca*. Parsnip. V, 73.

1. Stem angular-furrowed, almost glabr. Umbels with 10 to 15 rays.—Way-sides, slopes; distrib. 7, 8 **sativa** L. 986.
- Stem cylindric, only streaked, taller than in the last (10—15 dm) and, like the ls, covered with a denser pubescence. Umbels smaller, with 5—7 rays.—As the last; W. V. 8, later than the last. **opaca** Bernh. 987.

249. *Heracleum*. Cow-parsnip. V, 89, 112.

1. Ls very large, the lower ones cordate-orbicular, only lobed, with roundish or obtuse lobes, at last almost glabr.—Shady places in the Jura (from Chasseron to Schafmatt). 7, earlier than the following **alpinum** L. 988.
- Ls. at least the lower ones, with distinctly separate divisions 2
2. Ls (about intermediate between the last and the following) palmatisect; segments 3, sometimes more or less confluent.—Stony, shady places in the Jura; also G. W. (Zermatt) O. 7 **montanum** Schleich. 989.
- Ls pinnatisect; segments 5—7, lobed or pinnatifid, the terminal often confluent with the upper lateral ones, the others gen. stalked.—b. *elegans* Jacq.*) L.-segments pinnatifid, with long, lanceolate or linear-lanceolate lobes.—Meadows; everywhere; b. the typical form chiefly in the subalp. 5, 6 **Sphondylium** L. 990.

250. *Tordylium*. Hart-wort. V, 88.

1. Ls rough, simply pinnatisect; segments coarsely incisocrenate, those of the lower ls oval-oblong, those of the upper ls oblong-lanceolate.—Uncultivated, stony places near Orbe. 7 **maximum** L. 991.

*) **H. longifolium** Schleich. (not Jacq.) differs, according to Godet, in the anthers being of a dark red and **H. sibiricum** L. has greenish or yellowish fls, not or scarcely rayed and glabr. ovary in the fl., requiring further examination. Kolliker and Boissier give this last as growing in Switz.

251. *Laserpitium*. *Laserpitium*. V, 76, 113.

1. Stem angular-furrowed, hispid below. Ls 2-pinnatisect; segments pinnatifid, with lanceolate lobes, rough at the edges. Fls white, yellowish when dried. (Rather like 981.)—Damp meadows, among bushes; not everywhere (wanting in U. L.). 7 **prutenicum L.** 992.
- Stem cylindric, finely streaked and glabr. 2
2. Pets yellowish, edged with red. Habit of 995. *L. luteolum* Gaud.—b. *rosidum* Chr., entirely glabr. (Val Maggia.)—Alp. and subalp.; G. T. W. (Zwischenbergen), sporadic also on the St. Gall Alp. 7 **Gaudini Morett.** 993.
- Pets white 3
3. Ls 3-pinnatisect, glabr., with lanceolate, entire segments. See N. Beitr. I, 13.—Stony, calc. slopes of Alp., subalp. and Jura. 7 **Siler L.** 994.
- L.-segments toothed or pinnatifid 4
4. Ls ternati—bipinnatisect; segments large, oval or oval-oblong, cordate at the base, glabr. or shortly hispid underneath.—Stony wooded hills, especially in the mount. and subalp. region. 6, 7 **latifolium L.** 995
- Ls several times decompound, with segments oval in contour, div. into linear lobes, more or less hairy. Resembling 964. *L. hirsutum* Lam., *L. Halleri* All.—Alp. (wanting in A.) 7 **Panax Gouan.** 996.

252. *Orlaya*. *Orlaya*. V, 92.

1. Ls 2—3-pinnatisect, with linear segments. Ray-pets very large (15 mm).—Among corn, especially in fields at a high elevation; fairly distrib. (wanting in G.). 6
grandiflora Hoffm. 997.

253. *Daucus*. *Carrot*. V, 91.

1. Ls 2—3-pinnatisect. Invol.-leaflets gen. pinnatifid. Central umbellule gen. suppressed in the wild pl., dark red.—Meadows, fields; everywhere; also cultivated (Carrot). 6
Carota L. 998.

254. *Turgénia*. *Turgenia*. V, 94.

1. Ls simply pinnatisect; segments lanceolate, inciso-dentate. Umbels with 2—4 rays.—Among the corn: W. (between Saillon and Leytron, Conthey, Sierre). 6
latifolia Hoffm. 999.

255. *Caúcalis*. *Caúcalis*. V, 94.

1. Secondary ribs of the fr. armed with a single row of prickles, glabr. Stem glabr. or with scattered spreading hairs.—Fields; fairly distrib. (wanting in T. U. A.). 6
daucoides L. 1000.

- Secondary ribs of the fr. armed with 3 rows of prickles, rough. Stem covered with numerous applied, reflexed hairs. Fr. smaller.—Fields, very rare and uncertain (adventitious); formerly in Wall. and near Bâle, recently found near Couvet (Canton Neuchâtel). 6 *leptophylla* L. 1001.

256. *Tórilis*. *Tórilis*. V, 93.

- 1. Umbels almost sessile, forming little clusters and composed of only 2—3 rays.—V. (near Charnex), adventitious? 4
* *nodosa* Gärt. 1002.
- Umbels with long peduncles and 9—12 rays . . . 2
- 2. Invol. of 5—12 (gen. 7—9) leaflets. Fr.-prickles not glochidiate.—Road-sides, hedges; everywhere. 6
Anthriscus Gmel. 1003.
- Invol. 0 or of 1 leaflet. Fr.-prickles glochidiate. *T. helvetica* Gmel.—Fields, especially after mowing (in less elevated situations with branches spreading from the base), hedges and thickets (in higher situations branched only in the upper part and with more erect branches); western Switz., W. Z. S. 7 . . . *infesta* Hoffm. 1004.

257. *Scandix*. *Scandix*. V, 95.

- 1. Ls 2—3-pinnatisect; segments pinnatifid with linear lobes. Fr.-beak very long (4—6 cm).—Cornfields (wanting in U. A.). 5, 6 . . . *pecten Veneris* L. 1005.

258. *Anthriscus*. *Beaked Parsley*. V, 87, 100.

- 1. Umbels with 8—15 rays, all peduncled. Perenn. pls. Type of *A. sylvestris* 2
- Umbels with 2—5 rays, partly peduncled, partly sessile. Bienn. pls 4
- 2. Ls 2-pinnatisect, segments cut into linear, distant lobes *A. sylvestris tenuifolia* auct., *A. torquata* Thom. not Duby.—Shady, rocky places; only near Bressaucourt in the Bernese Jura. 6 *alpina* Jord. 1006.
- Ls 2—3-pinnatisect; segments oblong-oval or oblong-lanceolate, more or less deeply incised 3
- 3. Ls 3-pinnatisect; the 2 lower segments of the first order each smaller than the middle part of the leaf. Fls all or almost all fertile.—Meadows; everywhere 4, 5
sylvestris Hoffm. 1007.
- Ls ternati—bipinnatisect; the 2 lower segments of the first order almost as large as the rest of the leaf. Central fls of the umbelules barren (chiefly male). Resembling 1011. *A. sylvestris alpestris* auct., *A. abortiva* Jord.—Mount. and subalp.; G. W. T. V. O. Dôle, Salève and probably in other places also! 6 *nitida* Garck. 1008.

- 4 (1). Rays of the umbel gen. finely pubescent. Fr. linear, glabr., more rarely (v. *trichosperma* Schult.) with setaceous prickles.—Hedges, road-sides; entirely naturalised in western Switz.; also cultivated; b. W. (Valère, Tourbillon). 5 **Cerfolium Hoffm.** 1009.
- Rays of the umbel glabr. Fr. oval, furnished with numerous hooked prickles.—Rubbish-heaps, road-sides; Tessin, western Switz.; otherwise sometimes adventitious. 4 **vulgaris Pers.** 1010.

259. *Chærophyllum*. **Chervil**. V, 100.

1. Pets ciliate. (Ls 2-pinnatisect; segments pinnatifid.) Type of *Ch. hirsutum* L. 2
- Pets not ciliate. (Stem often tinted with red) 4
2. Carpophore only 2-fid at the top. Fls white or rose-coloured. *Ch. hirsutum* Koch not L.—Damp meadows, brooks; distrib. 5 **Cicutaria Vill.** 1011.
- Carpophore 2-partite to the middle or still deeper 3
3. Pets ciliate all round. Stem more hairy than in the last. Involucel-leaflets lanceolate, greener, with stronger and longer ciliæ. Fr. larger. *Ch. hirsutum* Vill., *Ch. alpestre* Jord.—Alp., subalp. and Jura. 6 **Villarsii Koch.** 1012.
- Pets ciliate only at the top. Involucel-leaflets linear-lanceolate, almost entirely scarious; l-segments longer than in the last; the lateral umbels often opp. or in whorls of 3.—Alp.; St. Bernhard à la Pierraz and probably in other places also. 6 **élegans Gaud.** 1013.
- 4 (1). Ls 3-pinnatisect; segments oval at the base, then lanceolate, pinnatifid at the base, only toothed towards the top (more or less short-haired or almost glabr.). Habit of 1007, from which it is distinguished by its fr. not being prolonged in a beak, of a brownish yellow when ripe (not black), also by its longer involucel-leaflets. *Anthriscus rupicola* God.—Hedges and wood-sides, especially in the mount. 6 **aureum L.** 1014.
- Ls 2-pinnatisect; segments oval or oval-oblong, lobed-pinnatifid, with obtuse mucronate lobes.—Hedges and thickets; distrib. 6 **temulum L.** 1015.

260. *Myrrhis*. **Cicely**. V, 100.

1. Ls soft, covered with a short, dense pubescence, 3-pinnatisect, with pinnatifid segments. Fr. large (20–25 mm), brown, as if varnished.—Alp., subalp and Jura; western Switz. and Graub.; also cultivated. 6 **odorata Scop.** 1016.

261. *Molopospermum*. **Moloposperm**. V, 116.

1. Ls 3-pinnatisect; segments oval at the base, then lanceolate, narrowed to a long point, deeply pinnatifid. Stem

10—20 *dm.* *Ligusticum peloponnesiacum* L.—Alp. and subalp.; Italian Switz. and Wall. 7 *cicutarium* Dec. 1017.

262. *Cónium*. Hemlock. V, 115.

1. Ls 3-pinnatisect, dull-green, entirely glabr, as also the stem; segments pinnatifid with teeth terminated by a whitish point. Petioles hollow. Involucels shorter than the umbellules (which distinguishes it from *Aethusa*). Distinguished from all the similar species of the genera *Anthriscus* and *Chærophylum* by the ribs of the fr. being undulated-crenate.—Uncultivated stony places, rubbish-heaps, hedges; distrib., but not usually plentiful. 6 *maculatum* L. 1018.

263. *Pleurospermum*. Pleurosperm. V, 116.

1. Ls 2—3-pinnatisect. Pl. glabr. 10—13 *dm.*—Thickets, wood-clearings; Mt. Generoso, Algabi (Simplon), Amlicon and Sulgen (Thurgau), Sentis. 7 *austriacum* Hoffm. 1019.

264. *Bifora*. Bifora. V, 78.

1. Ls 2—3-pinnatisect; segments pinnatifid, lobes of the lower ls linear, of the upper ls filiform.—Fully, Vevey, Geneva; adventitious, but appears to spread. 6 **radians* Bieb. 1020.

265. *Coriandrum*. Coriander. V, 78.

1. Lower ls simply pinnatisect, with round-obovate, inciso-lobed segments; upper ls 2-pinnatisect, with narrow linear segments. Fr. globular, pale yellowish brown.—Cultivated and sometimes subsontaneous 6 *†sativum* L. 1021.

51. Araliaceæ.

266. *Hédera*. Ivy. V, 5.

1. Ls angular, 3—5-lobed, those of the fl.-branches rhomboidal, undiv.—On old trees, walls, and rocks, climbing or creeping; everywhere. 9 *Helix* L. 1022.

52. Cornaceæ.

267. *Cornus*. Cornus. IV, 7.

1. Fls white, appearing after the ls, in branchy corymbs without invol. Fr. blackish.—Hedges and thickets; distrib. 5 *sanguinea* L. 1023.

- Fls yellow, appearing before the ls, in simple umbels surrounded by an invol. of 4 leaflets. Fr. cherry-red. Cornel-cherry.—Thickety hills; T. W. V. A.; also cultivated. 3 **mas** L. 1024.

OBS. *C. stolonifera* Michx. (alba auct.) is also cultivated in shrubberies, having ls gray underneath and white fruit.

53. Loranthaceæ.

268. *Viscum*. Mistletoe. XXII, 2.

1. Pl. of a yellowish green, with dichotomous ramification. Fls gen. in clusters of 3—5.—b. *laxum* Boiss. Reut. Ls narrower, berries ovoid, yellow. See N. Beitr. II, 7. —Parasitic on various trees (rarely on conifers or oaks). 3, 4 **album** L. 1025.

54. Caprifoliaceæ.

269. *Adóxa*. Moscatel. VIII, 18. X, 11.

1. A small, delicate pl. Stem with 2 ls in the upper part, and a terminal head composed of 4—5 (3—7) fls. Ls 2-ternatisect.—Along hedges; distrib., especially in western Switz. 3 **moschatellina** L. 1026.

270. *Sambucus*. Elder. V, 136.

1. Stem herbaceous (green), stipules leaf-like, oval-oblong. Anthers red, finally black. *Ebulum humile* Garck.—Wood-edges, slopes; distrib. 6 **Ebulus** L. 1027.
— Stem woody; shrubs or trees. Stipules 0, or wart-like. Anthers yellow 2
2. Fls white or yellowish white, in flat cymes (which have 5 primary branches, not 3 as in the last). Fr. dark-violet.—Woods; distrib.; also cultivated in shrubberies with finely-cut, variegated ls. 6 **nigra** L. 1028.
— Fls greenish yellow, in ovoid panicles. Fr. red. Mountain woods; distrib. 4, 5 **racemosa** L. 1029.

271. *Viburnum*. *Viburnum*. V, 136.

1. Ls undiv., oval, toothed, flaky-tomentose underneath. Fls all alike. Fr. compressed, passing from red to black at maturity.—Woods, thickets; distrib. 5 **Lantána** L. 1030.
— Ls 3—5-lobed, green on both sides. Fls of the circumference larger, barren (having neither styles nor stas). Fr. globular, red.—Woods, damp thickety places; distrib. A. variety (v. *roseum* L.) with globular inflorescences

composed exclusively of barren fls is frequently cultivated in gardens. 5 *Opulus* L. 1031.

272. Lonicera. Honeysuckle. V, 14.

1. Stem flexible. Fls in sessile cymes in the l.-axils, or in a terminal head. Woodbine 2
- Stem not flexible. Cymes (2-fl'd through suppression of the central fl.) peduncled in the l.-axils 4
2. Ls all separate. Cymes united in a terminal head, peduncled.—Woods and thickets; not everywhere (wanting in G. T. S.). 6 *Periclymenum* L. 1032.
- The upper pairs of ls united at the base 3
3. Terminal head sessile.—Hedges, thickets; sometimes spontaneous. 6 *Caprifolium* L. 1033.
- Terminal head peduncled.—As the last; W. (Saillon). 6 *etrusca* Santi. 1034.
- 4 (1). Ovaries (and later the berries) entirely or almost entirely united 5
- Ovaries only united at the base 6
5. Common peduncles much shorter than the fls. Berries of a bluish black. Ls obtuse or subacute.—Mountain woods (wanting in L. Z. S.). 6 *coerulea* L. 1035.
- Common peduncles 3 or 4 times as long as the fls. Berries red. Ls acuminate (large).—As the last; distrib. 5 *alpigena* L. 1036.
6. Common peduncles as long or slightly longer than the fls. Berries red. Ls soft-pubescent.—Hedges; everywhere. 5 *Xylósteum* L. 1037.
- Common peduncles 3—4 times as long as the fls. Berries black. Adult ls almost glabr.—Mountain woods (wanting in S.). 5 *nigra* L. 1038.

273. Linnæa. Linnæa. XIV, 27.

1. Stem filiform, creeping, with erect fl.-branches. Fls in small cymes of 2 (rarely 4) fls, of a rosy white colour. Ls orbicular or oval.—Woods of the Alp.; G. T. W. O. U. 7 *borealis* L. 1039.

55. Stellatæ.

274. Sherardia. Sherardia. IV, 4.

1. Ls in whorls of 4—6. Fls of a violet-rose colour. Stem branched, spreading.—Fields; distrib. 5 *arvensis* L. 1040.

275. Asperula. Asperule. IV, 4. III, 2.

1. Fls blue, exceeded by the long-ciliate invol.-ls. Ann. pl.—Fields; not common (wanting in B. U. A.). 6 *arvensis* L. 1041.

- Fls white or rose-coloured. Perenn. pl. 2
- 2. Fr. rough with hooked prickles. Lower ls in whorls of 6, the upper of 8. Fls white. Woodruff.—Shady woods; distrib. 5 **odorata** L. 1042.
- Fr. glabr. 3
- 3. Ls oval-oblong, ciliate, in whorls of 4 — Woods and thickets. Central Switz. from the Rhine-valley of Canton St. Gall and Chur to the lake of Thun; Tess. 5 **taurina** L. 1043.
- Ls linear 4
- 4. Ls gen. in whorls of 8, stiff, glaucous. Cor. almost campanulate (tube very short). A. galioides Bieb.—Stony, thickety hills, rather rare; Chur, lower Rhone-valley as far as Sierre! Geneva, Burgdorf, Istein, Schaffh. 6 **glauca** Bess. 1044.
- Ls in whorls of 4—6. Cor. infundibuliform 5
- 5. Rt.-stock creeping, red, gen. bearing isolated, almost erect stems. Cor. white, 3-fid. Fr. smooth.—Calc. hills, rare; Orbe, Brazel, Canton Neuchâtel, Weiacherberg, Canton Zürich and Canton Schaffh. 6 **tinctoria** L. 1045.
- Rt.-stock descending, bearing several or many stems. Cor. rose (rarely almost white), 4-fid. Fr. wrinkled, papillose. Type of *A. cynanchica* 6
- 6. Cor.-tube as long or hardly longer than the limb. Stems 15—25 cm, numerous, spreading-ascending.—b. *arenicola* Reut. Pl. taller, cor.-tube rather longer.—Dry places, slopes; distrib. 6 **cynanchica** L. 1046.
- Cor.-tube 2—3 times as long as the limb. Stems 30—60 cm, more erect 7
- 7. Cor.-tube hardly twice as long as the limb.—As the last; Tess. 7 **flaccida** Ten. 1047.
- Cor.-tube almost 3 times as long as the limb. Ls shorter than in the last.—As the last; W. 7 **montana** Willd. 1048.

276. *Rubia*. Madder. IV, 3. V, 14.

- 1. Ls in whorls of 4—6, lanceolate, furnished at the edges and underneath on the middle nerve, as also on the stem with reflexed prickles. Fls yellowish.—W. (Vine countries, from Martigny to Stalden: Jaccard) and sometimes subsontaneous in consequence of former cultivation. 6 **tinctorum** L. 1049.

277. *Galium*. Bedstraw. IV, 3.

- 1. Fls yellow or pale yellow 2
- Fls red or rose-coloured. (Fr. glabr.) 6
- Fls white or dirty white, sometimes rather reddish on the outside 8

2. Ls oblong or elliptic, in whorls of 4. Fl.-cymes only axillary. Fr.-peduncles bent back **3**
- Ls linear or linear-lanceolate, in whorls of 6—12. Cymes terminal and axillary. Fr.-peduncles straight **5**
3. Stem furnished at the angles with small prickles directed downwards.—Sandy places; T. W. J.! 4, 5
pedemontanum All. 1050.
- Stem with no small prickles, glabr. or hairy **4**
4. Peduncles with bracts. Stem rough.—Hedges, wood-sides! distrib. 4 **Cruciata Scop. 1051.**
- Peduncles without bracts. Stem glabr. or with a short pubescence.—Shady, stony places of Italian Switz. 4
verum Scop. 1052.
- 5 (2). Fls. of a golden yellow. Ls in whorls of 8—12, narrow, linear, rolled at the edges, with a short pubescence and gray underneath. Stem cylindric, with 4 fine ridges. Panicle rather dense.—b. *præcox* Lang. (G. Wirtgeni F. Schultz, G. eminens G. G.) Articulations of the stem (which is more erect) longer than the fl.-branches, which are far apart.—Dry meadows, slopes; distrib. 7. b. Tess, Vaud, Wall., Bâle, the end of May **verum L. 1053.**
- Fl. of a light or whitish yellow. Ls gen. broader than in the last, less rolled, or flat. Stem quadrangular. Panicle looser. Hybrids of G. verum with G. Mollugo and rigidum!*) **ochroleucum Wolf. 1054.**
- 6 (1). Fls. of a blood-red, very small. Stem almost erect, much branched.—Hills; T. 7 **purpureum L. 1055.**
- Fls. of a lighter red or growing paler at last. Stem decumbent **7**
7. Cor.-lobes terminated by a long hair-like point. Fr. distinctly granular.—Stony places, hills; G. T. U. (Schöllenen). W. (Zwischenbergen). Batlis on the lake of Wallenstadt. 7 **rubrum L. 1056.**
- Cor.-lobes simply acute. Fr. smooth, or finely granular. Comp. G. sylvestre 17.
- 8 (1). Ls in whorls of 4, 3-nerved *i. e.* with a longitudinal, fainter nerve on each side on the central one **9**
- Ls in whorls of 6—12 (only in 1068 of 4), 1-nerved **10**
- Ls in whorls of 6, 1-nerved, distinctly net-veined, oblong-lanceolate. Cymes axillary, 3—several-fld. Fr. small, covered with fine hooked prickles. Pl. smelling of coumarin.—Woods; only near Tarasp! 6 **triflorum Michx. 1056a.**
9. Ls broad oval, short-mucronate. Stem rather weak, ascending. Fr. rough.—Mountain woods; distrib. 5
rotundifolium L. 1057.

*) Also: **G. approximatum, decolorans** and **ambiguum Gr. Godr.**
See Rapin Guide bot.

- Ls lanceolate not mucronate. Stem stiff, erect. Fr. covered with small hooked prickles, rarely (b. *hyssofifolium* Hoffm. in Graub.) glabr.—Damp fields (wanting in T. U. L.). 6
boreale L. 1058.
- 10. Stem glabr. or hairy but with no small, reflexed prickles. Fr. not rough with hooked hairs **11**
- Stem almost always covered with small, reflexed prickles (sometimes almost glabr. in No. 1068), brittle, clinging to the hands, clothes &c. **18**
- 11. Pedicels hair-like drooping before the time of flowering. Stem cylindric, with 4 fine ridges. Ls oblong-lanceolate, with their greatest width above the middle, gray-green underneath.—Woods; distrib. 6 . . . **sylvaticum L. 1059.**
- Pedicels always erect. Stem quadrangular **12**
- 12. Cor.-lobes terminated by a hair-like point. Stem upright or ascending, sometimes also weak, decumbent or climbing **13**
- Cor.-lobes simply acute. Stem prostrate or ascending **16**
- 13. Fr. distinctly granular. Comp. G. rubrum 7.
- Fr. smooth or slightly wrinkled **14**
- 14. Ls insensibly narrowed towards the top, glaucous underneath. Branches of the panicle hair-like. Resembling 1059, but the ls are insensibly narrowed from the middle to the top. G. aristatum L.—Tess., Pfäfers. 7
lævigatum L. 1060.
- Ls obtuse, mucronate, almost of the same colour on both sides. Type of *G. Mollugo* **15**
- 15. Ls oblong, or oblong-obovate, broader towards the top, obtuse, short-mucronate, thin, gen. dull, with central nerve not very prominent, (when dry and held to the light) with anastomosed lateral nerves. Stem of 100—150 cm, gen. weak, ascending or supporting itself on bushes. Branches of the panicle horizontal. divided into spreading pedicels.—b. *insubricum* Gaud. Panicle less densely fld, with still finer branches and pure white fls.—Hedges and thickets, but, apparently not everywhere; b. Tess. 7, later than the following!
elatum Thuill. 1061.
- Ls oblong-lanceolate or linear-oblong, not much broader towards the top, short-mucronate, of a firmer consistency than in the last, and more often shining. with central nerve rather more prominent, but without anastomosed lateral nerves. Stems 30—60 cm, numerous, often bushy, ascending. Branches of the panicle horizontal or (v. erectum) spreading-erect, and then the stems more solitary and more erect. G. dumetorum Rap.—Pasturages, road-sides; everywhere. 5, 6
Mollugo L. 1062.

- As *G. Mollugo erectum*, but the ls thicker and narrower, linear or linear-subulate, often longer-mucronate and with a broader nerve on the back. Stems more solitary, erect, lower. Branches of the panicle gen. more spreading. *G. erectum* auct. p., *G. lucidum* auct. not All. *) *G. cinereum* Gaud.—As the last; *G. T. W.*, Lake of Wallenstadt, Sargans. 5, 6 . . . ***rigidum* Vill. 1063.**
- 16 (12). Fr. entirely covered with tubercles visible to the naked eye. Pl. with barren, tufted stems. Ls in whorls, gen. of 6, broader than in 1066.—Chur, Brügg; other localities appear doubtful! 7 . . . ***saxatile* L. 1064.**
- Fr. smooth or finely granular. Ls gen. in whorls of 8 **17**
17. Ls bordered with small prickles which are directed forwards, otherwise glabr., rather fleshy, with scarcely any middle nerve; very short-mucronate. Fr.-pedicels arched-reflexed. Pl. with numerous stems, spreading on the ground and forming a tuft, becoming yellow when dried.—Debris of the Alp., descending sometimes with torrents. 7 . . . ***helveticum* Weig. 1065.**
- Ls glabr. or pubescent, the middle nerve more or less prominent underneath; distinctly mucronate. Fr.-pedicels straight.—Var.: glabr., or (var. *Bocconeii* Dec.) short-pubescent in the lower portion; with fls white or (var. *rubellum*) reddish. With this are connected *G. montanum* Vill., *G. commutatum* Jord. &c.—b. *anisophyllum* Vill. (alpestre R. and Sch.) Stem lower, more erect; panicle almost corymb-shaped; fls rather larger; pl. easily becoming black in drying.—c. *tenue* Vill. like the last var., but stem slenderer, ls narrower, and longer-mucronate; fls almost only half the size; pl. not turning black when dried.**)—d. *austriacum* Jacq. (*pumilum* Gaud. Koch p.***)) Stem branching from the base, with spreading branches; ls stiff, shining, linear-subulate, not, or scarcely broader towards the top.—Pasturages, wood-sides, slopes; distrib.; b. and c. Alp. and Jura; d. Simplon; 6, 7 . . . ***sylvestre* Poll. 1066.**
- 18 (10). Perenn. pls growing in marshy places. Diameter of the cor. greater than that of the adult fr.; the latter without hooked bristles . . . **19**

*) *G. corrudæfolium* Vill. (*lucidum* All.) appears to me to differ in the stiffer acicular ls, the broader, silvery middle nerve, and narrower, almost unilateral panicle. Piemont! Wall.: Rehb. f.—*G. cinereum* All., an entirely different species, is not found in this country.

**) *G. puberulum* Christ (Ravellenfluh) appears to be a pubescent *G. tenue*.

***) The true *G. pumilum* Lam. does not grow in Switzerland.

- Ann. pls, growing in dry places. Diameter of the cor. less than that of the adult fr.; the latter often with hooked bristles **21**
- 19. Ls mucronate, in whorls of 6—8. Anthers yellow. Pl. remaining green when dried.—Marshes; distrib. but not common. 5 **uliginosum L. 1067.**
- Ls not mucronate, gen. in whorls of 4, more rarely of 5—6. Anthers red. Pl. turning black when dried. Type of *G. palustre* **20**
- 20. Branches of the panicle very spreading or even deflexed. Fr. almost smooth, small. Stem delicate, 20 to 40 cm.—Damp meadows, ditches; everywhere. 5
palustre L. 1068.
- Branches of the panicle less divergent. Fr. more distinctly wrinkled, larger (2—3 mm broad). Stem stronger, 30—100 cm.—As the last and with it, fairly distrib. at least in the Swiss plains, but later
elongatum Presl. 1069.
- 21 (18). Ls rough at the edges in consequence of small prickles directed forwards **22**
- Ls rough at the edges in consequence of small prickles directed backwards **23**
- 22. Cymes many-fl'd, terminal and axillary, arranged in a panicle. Fls all hermaphrodite. Fr.-pedicels straight. Fr. small (1—1½ mm broad), finely wrinkled. *G. ruricolum* Jord. (panicle denser).—b. *litigiosum* Dec. Fr. rough with hooked hairs.—Sandy fields; T. W. V. J. Z. A. (mostly in western and southern Switz.). 6 **parisiense L. 1070.**
- Cymes 3-fl'd, only axillary (in the axils of the ls). Fls polygamous, the central fl. hermaphr. and fertile, the lateral male and barren. Fr.-pedicels arched-reflexed. Fr. large (4—5 mm), covered with very prominent tubercles.—Fields; very rare and only variable. 5
***saccharatum All. 1071.**
- 23. Cymes not longer than the l., gen. 3-fl'd. Fr.-pedicels arched-reflexed. Fr. large, tuberculous.—Fields; not everywhere. 6 **tricorne With. 1072.**
- Cymes longer than the ls, gen. many-fl'd. Fr.-pedicels straight. Type of *G. Aparine* **24**
- 24. Fr. large (4—5 mm), tuberculous, covered with hooked hairs, rarely glabr. Stem 30—150 cm, more or less swollen at the joints and rough. Fls dirty-white, small. Cleavers. —b. *tenerum* Schl. Stem delicate, few-fl'd; ls thin, broader; fr. small (1½—2½ mm); on debris (Zermatt, Gemmi, Salève).—Hedges, thickets, fields; everywhere. 6
Aparine L. 1073.
- Fr. smaller (2—2½ mm), granular, i. e. only with very small tubercles, glabr. or more rarely (b. *Vaillantii*

Dec.) covered with hooked hairs. Stem 10—50 *cm*, slenderer than in the last, not, or scarcely, swollen at the nodes which are glabr.—Fls greenish, still smaller than in the last; ls narrower. Fields and waste places, especially among flax; distrib. but not common; b. distrib. through the whole of Wall.; Jaccard. 6

spúrium L. 1074.

56. Valerianaceæ.

278. *Centranthus*. *Centranth*. I, 4.

1. Spur of the cor. about as long as the ovary. Ls linear-lanceolate or linear.—Detritus in the Jura (from Weissenstein to Creux du Van). 6 *angustifolius* Dec. 1075.
- Spur of the cor. twice as long as the ovary. Ls oval or oval-lanceolate. Rocks and walls in the warmer parts of Switz., naturalised; Locarno, Sion, Rolle, Grandson. 5, 6 *ruber* Dec. 1076.*)

279. *Valeriana*. *Valerian*. III, 4. XXII, 22.

1. Ls all pinnatisect; segments with 3—11 pairs, toothed. Fls (pale rose-coloured) gen. all alike, hermaphrodite. Type of *V. officinalis* 2
- Ls all, or at least the lower ones, undiv. Fls dissimilar, sometimes chiefly male, sometimes chiefly female, or dioecious 3
2. Segments of the ls with 7—11 pairs, lanceolate or linear-lanceolate. Stolons subterranean (Gren.).—b. *angustifolia* Tauch. Leaf-segments narrower; stem slenderer, lower. Damp fields, thickets; b. stony, thickety mountain slopes. 6 *officinalis* L. 1077.**)
- Segments of ls with 3—5 pairs, broad, oval-oblong to lanceolate-oblong, the terminal one much larger. Stolons above ground.—Damp woods of central Switz.; G. B. U. Glarus, St. Gall. 6, rather earlier, it is said, than the last *sambucifolia* Mik. 1078.
3. Rt.-stock creeping, stoloniferous. Caul. ls lyrate-pinnatifid (rarely varied, with only undiv. ls).—Damp meadows, ditches; distrib. 4 *dioica* L. 1079.
- Rt.-stock cylindric, oblique or vertical, bearing several stems, without stolons 4

*) With this is connected *C. intermedius* Rap. (?). Ls rather narrower. Spur as in 1075. Rolle.

**) *V. exaltata* Mikan has a rt.-stock bearing several stems but no stolons; Switz.: Nyman; in the Jura of Baden: Döll; Vintschgau: Hausm.

4. Cymes of the fls whorled, almost arranged in a spike. Stem 8—12 *cm*. Ls entire, glabr., the caul. linear. Fls of a dirty yellow.—High Alp.; W. (Saasthal, Zermatt, St. Bernard, 7 **celtica** L. 1080.
- Cymes of fls contracted into a head. Stem 5—15 *cm*. Fls pale rose-coloured **5**
- Cymes, at least when in full bloom or when bearing seed. arranged in a corymb. Stem 10—45 *cm* **6**
5. Ls ciliate, entire or slightly toothed.—Calc. Alp.; G. (Münsterthal and Val Muschem). 7 . . . **supina** L. 1081.
- Ls glabr., entire.—Alp.: W. V. B. O. (western Switz.). 7 **saliunca** All. 1082.
6. Stem 10—30 *cm*, leafless, or with 1 pair besides the floral ls. Rt-stock covered with remnants of ls of former years. Fls white.—Alp. G. T. U. A. (especially in eastern Switz.). 6 **saxatilis** L. 1083.
- Stem 25—45 *cm*, with 3 or several pairs of ls. Rt-stock without the remains of ls of former years. Fls rose **7**
7. Ls rather firm, gen. of a bright green, shining, those of the non-floriferous stems rounded at the base, scarcely cordate, the caul. ls gen. undiv. (very rarely trisect).—Rocky places of mount. and subalp. 5, 6 **montana** L. 1084.
- Ls softer, of a rather ashy green, dull, those of the non-floriferous stems distinctly cordate, the caul. gen. trisect (rarely 5-sect), very rarely (v. *intermedia* Hopp.) undiv.—As the last. 5 **tripteris** L. 1085.

280. *Valerianella*. Corn-salad. III, 4.

1. Cal.-limb indistinct on the fr. Spring pls (4—5). Stem about 15 *cm* **2**
- Cal.-limb distinct on the fr., obliquely truncate, one tooth (the back one) distinctly larger. Summer pls (6—7). Stem 30—40 *cm* **3**
2. Fr. round-ovoid, rather compressed, fairly flat on both sides, wrinkled crosswise. Common corn-salad.—Fields, road-sides, grassy places; everywhere. 4 **olitoria** Poll. 1086.
- Fr. linear-oblong, quadrangular, with a deep furrow on one side.—As the last, but almost exclusively in western Switz. 4 **carinata** Lois, 1087.
3. Cal.-limb as broad as the fr.; net-nerved. Fls more dense than in the 2 following. V. *eriocarpa* auct. not Desv.—Fields; very rare and probably only adventitious. (Middes, St. Blaise, Aubonne, Zürich) ***incrassata** Chaub. 1088.
- Cal.-limb distinctly narrower than the fr., not net-nerved **4**

4. Fr. ovoid-globular, swollen, the empty cells contiguous, larger than the fertile ones, *V. rimosa* Bast. *V. dentata* Dec. not Poll. (anterior teeth of cal.-limb more distinct). —Fields; distrib. **Auricula** Dec. 1089.
- Fr. ovoid-conic, with empty cells not contiguous, narrow, filiform. *V. dentata* Poll.—As the last
Morisonii Dec. 1090.

OBS. Almost all the species are varied with more or less glabr. (v. *leiocarpa*) or pubescent (v. *lasiocarpa*) fruit.

57. Dipsacæ.

281. *Dipsacus*. Teasel. IV, 16.

1. Heads almost globular, barely 3 *cm.* Invol.-leaflets shorter or only as long as the scales. Ls petioled, often auricled at the base (with 2 small segments).—Fls white or yellowish white. Anthers blackish. Habit of a *Knautia*. —Hedges, water side; distrib. but not common. 7
pilosus L. 1091.
- Heads ovoid-oblong, 6—8 *cm.* Outer invol.-leaflets much longer than the scales. Caul. ls sessile, broadly united at the base 2
2. Caul. ls ciliated with bristles, always pinnatifid. Fls whitish.—Road sides, water side; rare; T. V. (?) J. 7
laciniatus L. 1092.
- Caul. ls with, or without, prickles at the edges, not ciliate. Fls pale lilac 3
3. Scales flexible, straight, longer than the fls. Invol.-leaflets linear-subulate.—Road-sides, shores; distrib. 7
sylvestris Huds. 1093.
- Scales very stiff, acuminate-recurved, about as long as the fl. Invol.-leaflets lanceolate-subulate.—Rarely cultivated. 7 † **Fullonum** Mill. 1094.

282. *Cephalária*. *Cephalaria*. IV, 18.

1. Caul. ls pinnatisect; segments 9—15. Fls pale yellow. Stem 1 *m.*—Alp., subalp. and southern Jura. G. W. V. B. Wallenstadterberg (especially in western Switz.). 7
alpina Schrad. 1095.

283. *Knautia*. *Knautia*. IV, 17.

1. Ls rather firm, grayish green, dull, the upper ones gen. pinnatifid, the lower gen. undiv., more rarely all pinnatifid or all undiv. Peduncles without glands, rarely (b. *glandulifera*) pubescent-glandular. Fls violet-blue. Varied to almost or entirely glabr. (v. *glabrescens*; Vevey!) —Fields, slopes; everywhere; b. Tess. (Lugano), Wall.! 6
arvensis Koch. 1096.

- Ls bright green, often rather shining, gen. all undiv. 2
- 2. Ls elliptic-lanceolate, thin, toothed, narrowed to a long point, narrow, entire, rarely incised or pinnatifid at the base. Peduncles pubescent-glandular (always?). Fls more reddish than in the last, and those of the edge less rayed. — b. *pubescens* (Maly?) see N. Beitr. III, 10. IV. 10. — Woods; distrib. 6, 7 . . . *sylvatica* Duby. 1097.
- Ls long-lanceolate, rather firm, entire or with distant teeth, glabr. as also the lower portion of the stem. Peduncles without glands. Fls lilac. K. Godeti Reut. — Damp fields in central Jura. 6 . . . *longifolia* Koch. 1098.

284. *Succisa*. *Succisa*. IV, 18.

- 1. Ls oblong-lanceolate, entire, rarely toothed. Fls blue. Fr.-heads almost globular. *Scabiosa Succisa* L. — Damp meadows, moist places in wood-clearings; distrib. 7
pratensis Mönch. 1099.

285. *Scabiosa*. *Scabiosa*. IV, 18.

- 1. Ls all linear, entire, silky. — Stony places; T 7
graminifolia L. 1100.
- Ls, at least the upper ones, pinnatipartite, never linear 2
- 2. Ls of the shoots which do not bear fls entire (rarely with a few isolated teeth). Cal.-awns about $1\frac{1}{2}$ —2 times as long as the limb of the outer cal., yellowish. — Pasturages; Bâle (St. Louis, Hüningen) *suaveolens* Desf. 1101.
- Ls of the non-flowering shoots undiv. and crenate, or lyrate. Type of *S. Columbaria* . . . 3
- 3. Cal.-awns short (brown), at most $1\frac{1}{2}$ —2 times as long as the limb of the outer cal. Ls more finely div. than in 1103. *S. gramuntia* auct. — Dry hills and grassy places; Engadine, Wall. and Tess. 6 . . . *agrestis* W. K. 1102.
- Cal.-awns 3—4 times as long as the limb of the outer cal. (Fr.-head resembling a globular brush!) . . . 4
- 4. Ls finely pubescent, not shining, the lower ones incisolyrate, the upper pinnatipartite, with pinnatifid divisions, and almost linear lobes. — b. *pachyphylla* Gaud. (*patens* Jord.) Ls more finely div.; heads smaller, on longer, more spreading peduncles. Cal.-awns brownish (instead of blackish), rather shorter (transitional form to 1102). — Dry hills, grassy places; distrib.; b. shores of the Lake of Geneva. 6 . . . *Columbária* L. 1103.
- Ls fairly glabr., rather shining, less div. than in the last, with broader lobes. Stem lower, often with 1 head; cal.-awns rather broader. — Alp., subalp. and Jura. 7
lúcida Vill. 1104.

58. Compositæ.

286. *Eupatorium*. Eupatory. XIX, 43.

1. Ls opp., 3—5-partite. Fls flesh-red.—Damp thickets, water side; distrib. 6 . . . *cannabinum* L. 1105.

287. *Adenostyles*. *Adenostyles*. XIX, 42.

1. Fls 10—20 in each head, heads in a compact corymb. Ls white-tomentose on both sides or (*A. hybrida* Dec.) almost glabr. above.—High Alp. G. W. O. 7
leucophylla Rchb. 1106.
- Fls 3—6 in each head. Ls glabr. or nearly so above 2
2. Ls irreg. toothed, more or less gray-tomentose underneath. Petioles gen. auricled.—Stony, bushy places in mount. and subalp. (wanting in S.) 7 *albifrons* Rchb. 1107.
- Ls rather tougher than in the last, fairly reg. toothed, glabr. underneath or hairy only on the nerves. Petioles rarely auricled.—As the last. 7 . *alpina* Bl. Fing. 1108.

OBS. *A. leucophylla* forms hybrids with *A. albifrons* (*A. hybrida* Dec. p.?) and *A. alpina* (*A. eginensis* Lagg.).

288. *Homogyne*. *Homogyne*. XIX, 41.

1. Rad. ls cordate-reniform, appearing with the fls. Stem 1-headed. Fls reddish.—Alp., subalp. and Jura, also lower. 6 . . . *alpina* Cass. 1109.

289. *Tussilago*. Colt's-foot. XIX, 70.

1. Rad. ls cordate-orbicular, appearing after the fls. Stem 1-headed. Fls yellow.—Road-sides, especially on clayey soil; everywhere. 3 . . . *Fárfara* L. 1110.

290. *Petasites*. Butter-bur. XIX, 41.

1. Ls almost cordate-triangular, tomentose and snow-white underneath.—Alp. and subalp.; Reculet. 4, 5
niveus Baumg. 1111.
- Ls cordate-orbicular, slightly tomentose or gray-woolly underneath . . . 2
2. Ls incised at the base as far as the 2 branches of the lateral nerves. Style of the hermaphrodite fl. slightly 2-fid at the top, with very short, ovoid stigs. Fl. rose-white.—Damp fields, brooks; distrib. 4
officinalis Mönch. 1112. *)
- Lateral nerve-branches bordered, towards the incision of the base, with leaf-substance. Style of the herma-

*) With this are connected *P. riparius* Jord. (fls scentless), *P. pratensis* Jord. (fls scented) and *P. Reuterianus* Jord. (fls appearing with the ls).

phrodite fl. deeply 2-fid at the top, with long, linear-lanceolate stigs. Fl. yellowish white.—Damp mountain woods; distrib. but not common. 4 **albus** Gärtn. 1113.

OBS. Pls almost diœcious, sometimes more fem., sometimes more hermaphr. Former botanists considered these 2 forms as distinct species.—Hybrids: *P. albus-niveus* and *P. niveus-officinalis*.

291. *Linósyris*. *Linósyris*. XIX, 46.

1. Stem with many ls. Ls linear. Fls yellow. *Chrysocoma Linosyris* L.—Hills exposed to the sun; scattered (wanting in U. L.). 8 **vulgaris** Cass. 1114.

292. *Aster*. *Aster*. XIX, 77.

1. Stem 1-headed. Heads large (35—50 *mm* in diam.).—b. *Wolfii Favrat!* Stem taller (20—25 *cm*); invol.-leaflets more acute; ray-fls blue (instead of violet).*)—Alp. Jura: b. Sion **alpinus** L. 1115.
- Stem bearing several, or many, smaller heads 2
2. Invol.-leaflets entirely herbaceous. Stem 30—40 *cm*, with a short rough pubescence, as also the ls.—Hills exposed to the sun (wanting in U.). 6, 7 . . **Amellus** L. 1116.
- Invol.-leaflets herbaceous at the top, but bordered on both sides by a scarious edge, broader towards the base. Stem 90—150 *cm*. Ornamental pls, chiefly from N.America, but naturalised here and there, especially on river-banks 3
3. Invol.-leaflets very lax, the outer ones spreading almost from the base. Caul. ls distinctly clasping at the base 4
- Invol.-leaflets appressed-imbricate, only spreading slightly at their extremity. Caul. ls narrowed towards the base, not clasping 5
4. Stem terminated by a pyramidal-oblong raceme. Heads of medium size (about 30 *mm* in diam.), gen. solitary at the top of the branches. Ray fls blue. 9
† **brumalis** Nees. 1117.
- Stem terminated by a corymb-shaped raceme. Heads gen. arranged in a raceme or corymb on the branches. Ray fls reddish-violet. 9 † **novi Belgii** L. 1118.
5. Invol.-leaflets about equal in length, the outer about as long as the inner. Heads fairly large. *A. salignus* Willd. 8 † **salicifolius** Scholl. 1119.
- Invol.-leaflets unequal in length, the outer only half as long as the inner, or still shorter. Heads the smallest of the genus. 8 † **parviflorus** Nees. 1120.

*) Another form is: **A. Garibaldii Brügg.** Size, habit and form of ls of 1115, but stem branched, bearing 2—7 heads which are much smaller. Above Bormio.

293. Bellidiástrum. Alpine Daisy. XIX, 69.

1. Habit of 1122, but pl. gen. larger, and easily distinguished by the acute invol.-leaflets, and the achenes crowned with white pappus.—Mountain woods, gorges; distrib. 6 **Michellii Cass. 1121.**

294. Bellis. Daisy. XIX, 65.

1. Ls all rad., spathulate, crenate. Stem 1-headed. Ray fls white, often red underneath.—b. *meridionalis Favrat*. More delicate, with small heads (Tessin).—c. *alpina Heer*, alpine form with large heads.—Fields, grassy places; everywhere. 3—10 **perennis L. 1122.**

295. Stenactis. Stenactis. XIX, 68.

1. Stem leafy. Heads in corymb. Ray fls white.—Embankments, water side, wood-clearings, originally from N.America, but fairly distrib., and often in large quantities. 7
ánua Nees. 1123.

296. Erigeron. Flea-bane. XIX, 51, 77.

1. Heads very small (3—5 mm), very numerous and forming a long panicle. Ray fls dirty-white.—Gravelly places, water side; a native of N.America; everywhere. 7
canadensis L. 1124.
- Heads larger, solitary or in a raceme, more rarely almost in a panicle. Ray fls violet or lilac, rarely white 2
2. Ray fls erect, as long as, or scarcely longer than, those of the disk 3
- Ray fls spreading, longer than those of the disk (alpine pls) 4
3. Ls slightly undulated, more or less hairy, as also the stem. E. *serotinus* Weihe (pappus reddish brown instead of white).—Slopes, way-sides; everywhere. 6—8
acris L. 1125.
- Ls flat, narrower, glabr. or only ciliate at the edges. Stem slenderer, fairly glabr. E. *droebachensis* auct., *elongatus* Ledeb.?—On gravel beds of alpine torrents, descending to the plain (*e. g.* as far as Aarau and Bâle). 6 **angulosus Gaud. 1126.**
4. Invol. very villous-woolly. Rad. ls obtuse (not mucronate). Stem always 1-fld, 5—10 cm.—High Alp. (on calc. with slightly darker fls). 7 **uniflorus L. 1127.**
- Invol. short-pubescent or glabr 5
5. Stem more or less glandular-viscous in the upper part 6
- Stem glabr. or hairy, but without glandiferous hairs (10—15 cm, 1-headed or with 2—3 heads) 7

6. Stem 25—40 *cm*, with branches bearing 1—3 heads. Pl. more robust than *E. acris*, with abundant glands and large heads.—Alp., not common. 7 **Villarsii** Bell. 1128.
- Stem 10—18 *cm*, divided into several long, 1-headed branches. Pl. less robust than the last, with rarer glands, ray shorter, pale or almost white. *E. rupestris* Schl. not Bl. Fing.—Rocks of Wall., on granite (Simplon, Saas, Zermatt, Bagnethal, Fully). 7 **Schleichéri** Grml. 1129.
7. Stem and ls more or less hairy. Inner, tubular-filiform, fem. fls numerous.—? b. *intermedius* Schl. (*acris-alpinus* Rchb.?) Pl. more robust, covered with numerous stiff, spreading hairs.—Alp. and Jura; b. Ormonds. 7 **alpinus** L. 1130.
- Stem almost glabr. Ls only ciliate. Inner, tubular-filiform, fem. fls 0 or few.—As the last. 7 **glabratus** Hopp. and Horn. 1131.

OBS. Hybrids: *E. acris-alpinus intermedius* Christ!; *E. acris-Villarsii* (Favrati Grml.); *E. alpinus-glabratus* and *E. alpinus-uniflorus* (according to Brügg.).

297. **Solidágo**. **Golden-rod**. XIX, 75.

1. Heads in upright racemes, not unilateral, which collectively form a panicle, or (in alpine forms) an almost simple raceme. *S. valesiaca* Bor. (forma umbrosa).—b. *alpestris* W. K. Pl. lower; ls narrower; heads less numerous, larger.—Woods; distrib.; b. Alp. and Jura. 6; b. almost a month earlier (as also the alpine forms of *Hieracium umbellatum*, *Serratula tinctoria* &c.!) **Virgaurea** L. 1132.
- Heads distinctly smaller, but much more numerous than in the last, in unilateral racemes, very spreading, recurved at the top, collectively forming a panicle.—Important N.American species, late, and easily naturalised in thickets by the water-side. *S. canadensis* L. *S. Sero-tina* Ait., *S. lanceolata* L. and others.

298. **Micropus**. **Micropus**. XIX, 54.

1. Habit of a Filago!—Sandy fields; W. V. 6 **erectus** L. 1133.

299. **Inula**. **Inule**. XIX, 76.

1. Inner invol.-leaflets enlarged at the top, obtuse. Stem 100—150 *cm*. Fls and ls large, the latter velvety-tomentose underneath, the caul. oval-cordate.—Cultivated, especially in mountain villages and sometimes spontaneous (Münsterthal in the Jura). 6 **Helénium** L. 1134.
- Inner invol.-leaflets linear or linear-lanceolate, acuminate 2

2. Achenes villous. Ls soft, villous-woolly, the caul. cordate-clasping.—Marshy fields; ditches; Rhone valley, Lakes of Geneva, Neuchâtel and Constance. 7
britannica L. 1135.
- Achenes glabr. 3
3. Ls gray-tomentose underneath, the caul. narrowed to the base.—Damp thickets, water side; western Switz. as far as Aarau, Giswyl. 8 **Vaillantii Vill.** 1136.
- Ls glabr. or covered with spreading hairs 4
4. Ls (and stem) villous or rough on both sides with spreading hairs thickened at the base. Stem bearing 1—3 heads. Invol.-leaflets erect.—Rocky, wooded places; T. Z. (Weiacherberg). S. (Wirbelberg). 6 **hirta L.** 1137.
- Ls glabr. or rough-ciliate at the edges. Outer invol.-leaflets curved outwards 5
5. Upper ls cordate-clasping. Stem gen. few-headed.—Damp meadows, hills, dry pasturages; distrib. 6
salicina L. 1138.
- Upper ls rounded at the base. Stem gen. many-headed, very leafy. *I. squarrosa* L. Koch.—Thickety hills; T. (Gandria). 7 **spiræifolia L.** 1139.

OBS. Hybrids: *I. hirta-salicina* (spuria Kern.); *I. salicina-Vaillantii* (semiamplexicaulis Reut.).

300. **Conyza.** **Conyza.** XIX, 51.

1. Ls. elliptic-lanceolate, slightly tomentose underneath. Heads in a corymb. Invol.-leaflets brownish, reflexed at the top. *Inula conyza* Dec.—Stony, thickety places, walls; distrib. 6 **squarrosa L.** 1140.

301. **Pulicária.** **Pulicária.** XIX, 76.

1. Heads of medium size. Ray fls spreading, distinctly longer than the invol. Caul. ls deeply cordate at the base.—Ditches; everywhere. 7, 8 **dysentérica Gärt.** 1141.
- Heads small. Ray fls erect, scarcely longer than the invol. Caul. ls with rounded base or scarcely half-clasping.—As the last; western Switz., rather rare. 7
vulgaris Gärt. 1142.

302. **Bupthalmum.** **Bupthalmum.** XIX, 61.

1. Ls oblong-lanceolate, the upper linear-lanceolate. Receptacle covered with scarious scales (which distinguishes this genus from *Inula*!)—b. *grandiflorum* L. Ls longer and narrower. Scales of recept. not truncate; probably a species.—Stony mountain slopes; pasturages; distrib. but not common; b. Tess., especially trans Cenere. 7
salicifolium L. 1143.

303. **Rudbeckia. Rudbeckia.** XIX, 58.

1. Stem 100—180 *cm*. Heads large. Ray-fls 45—50 *mm* long, bright yellow; disk fls greenish brown.—Naturalised in river side thickets, *e. g.* near Chexbres, near Stein; a N.American pl. 7. **laciniata* L. 1144.

304. **Helianthus. Sunflower.** XIX, 60.

1. Ls all cordate-oval. Heads very large (as much as 30 *cm* diam.), drooping.—Cultivated; a native of N.America. 7, 8 † *annuus* L. 1145.
- Upper ls oval-oblong. Heads smaller, erect. Jerusalem Artichoke.—Cultivated. 9, 10. † *tuberosus* L. 1146.

305. **Bidens. Bidens.** XIX, 30, 58.

1. Ls dark green, narrowed into a short winged petiole, gen. 3—5-partite (rarely, in small pls, undiv.). Heads erect, gen. without rays (rarely with rays).—Damp places, ditches, rubbish-heaps; distrib. 7, 8 *tripartita* L. 1147.
- Ls light green, sessile, slightly united at the base, undiv., toothed. Heads gen. nodding and rayed.—As the last, but less common. 7, 8 *cérnua* L. 1148.

306. **Carpésium. Carpésium.** XIX, 53.

1. Resembling *Bidens cernua* var. *discoidea*, but ls altern.—Damp places, road-sides, wooded mountain slopes; lower Rhone valley; Lakes of Geneva, Thun, Constance and the four Cantons. 7 *cérnum* L. 1149.

307. **Filago. Filago.** XIX, 48.

1. Invol.-leaflets cuspidate, not spreading at maturity. Heads in clusters of 10—30. Type of *F. germanica* L. 2
- Invol.-leaflets rather obtuse, spreading in the form of a star at maturity. Heads in clusters of 3—7 4
2. Branches spreading. Ls narrowed to the base. Clusters composed of 10—15 heads, exceeded by the floral ls, *F. germanica pyramidata* Gaud.—Fields, slopes; V. Bâle. 7 *spatulata* Presl. 1150.
- Branches erect. Ls not narrowed to the base. Clusters composed of 15—30 heads 3
3. Pl covered with a yellowish green tomentum. Invol.-leaflets reddish at the top. *F. lutescens* Jord.—As the last; localities still uncertain! W. V. Bâle, Diessenhofen. 7 *apiculata* Sm. 1151.
- Pl. covered with a whitish gray tomentum. Invol.-leaflets yellowish at the top.—As the last and sometimes with it. 7 *canescens* Jord. 1152.

308. **Gnaphalium.** Cud-weed. XIX, 50.

1. Heads clustered. Ann. pls. 2
 — Heads in a spike, more rarely in a raceme or solitary. Perenn. pls. 3
 2. Invol.-leaflets pale yellow. Ls narrowed to the base. —Uncultivated places; almost exclusively in southern and western Switz. 6 **luteoalbum** L. 1156
 — Invol.-leaflets brownish. Caul. ls half-clasping. —Var. with achenes smooth or (v. pilulare) fine-bristly. —Damp fields, inundated ground; distrib. 6 **uliginosum** L. 1157.
 3. Outer invol.-leaflets more than half as long as the heads (almost $\frac{2}{3}$ the length). Tufted pls. Stem thin, almost filiform, 2—10 cm. Heads in a short spike or (v. fuscum Scop.) almost in a raceme or (v. subacaule) solitary at the top of the stem. —High Alp. and Reculet in the Jura. 7 **supinum** L. 1158.
 — Outer invol.-leaflets only $\frac{1}{3}$ the length of the head 4
 4. Ls all of the same length, or decreasing little by little towards the top, gen. 1-nerved, finally glabr. above. Heads gen. numerous, in a long, gen. branching, spike; not to be confused with the following, an impoverished form (var. Einseleana F. Schultz) of the high Alps. Stem 20—50 cm. —Wood-clearings; distrib. 6 **sylvaticum** L. 1159.
 — Middle caul. ls as long as, or longer than; the lower ones 5
 5. Ls 3-nerved, slightly tomentose above. Stem 12—25 cm. Heads darker than in the last, fewer, in a shorter, dense, almost simple spike. —Alp., Chasseron in the Jura? 7 **norvegicum** Gunn. 1160.
 — Ls indistinctly 3-nerved, very tomentose on both sides. Stem 2—10 cm, bearing 1—5 heads. High alpine form of the last? 7, 8 (later than 1158 which resembles it: Neilreich) **Hoppeanum** Koch. 1161.

309. *Leontopodium*. Edelweiss. XIX, 50.

1. Heads clustered almost in an umbel at the top of the stem, surrounded and exceeded by the white-woolly, star-shaped bracts.—Alp., Dôle. 7. **alpinum** Cass. 1162.

310. *Antennaria*. Cat's-foot. XIX, 46, 49.

1. Heads white or rose-coloured. Pl. with long stolons.—Hills, pasturages, mount.; distrib. 5 **dioica** Gärtn. 1163.
- Heads brownish. Stolons 0.—High Alp. 7 **carpathica** Bl. and Fing. 1164.

OBS. *A. margaritacea* R. Br. originally from N.America, is found spontaneous sometimes in church-yards and near old castles.

311. *Artemisia*. Wormwood. XIX, 55.

1. Ls entire, linear-lanceolate, glabr. Tarragon. Cultivated. 7, 8 **† Dracunculus** L. 1165.
- Ls div., at least the lower ones 2
2. Receptacle hairy 3
- Receptacle glabr. 5
3. Stem 50–100 cm, branchy. Heads nodding, paniced 3*
- Stem 10–15 cm, simple. Heads erect, in a raceme or spike. High alpine pls 4
- 3.* Ls auricled at the base of the petiole, div. into linear lobes. Branches of the panicle almost erect. Mt. Vuache, not far from Geneva! (Como, Alsace.) 7 ***camphorata** Vill. 1166.
- Ls not auricled, div. into lanceolate lobes. Branches of the panicle spreading.—Stony, uncultivated places. G. T. W. V., Wallensee; sometimes cultivated. 7, 8 **Absinthium** L. 1167.
4. Heads about 15-fld, yellowish, in a raceme or spike. —High Alp. 7 **Mutellina** Vill. 1168.
- Heads 30–40-fld, gold-yellow, clustered almost in a corymb at the top of the stem.—High Alp. W. (Binn, Simplon, Zermatt, Bagnethal). 7 **glacialis** L. 1169.
- 5 (2). Heads globular or globular-ovoid 6
- Heads oblong or ovoid-oblong 10
6. Ls auricled at the base of the petiole (2–3-pinnatifid, with linear lobes) 7
- Ls not auricled at the base of the petiole 9
7. Heads gray tomentose. Stem 40–60 cm, branchy; forming a panicle.—Subspontaneous near old castles. (Mont le Grand, Ramstein, Hohentwiel.) 8 **pontica** L. 1170.
- Heads gen. glabr. 8
8. Stem 30–60 cm, branching in a panicle. Heads ovoid. —Uncultivated places; not everywhere (wanting in O. U. L. S.). 7, 8 **campestris** L. 1171.

- Stem 10—15 *cm*, gen. bearing a simple raceme, rarely rather branchy (v. *racemulosa*). Heads globular, otherwise varying in size.—Alp.; W. (only from Zermatt to Binn). 7 *nana* Gaud. 1172.
- 9(6). Stem 5—15 *cm*, terminating in a simple spiciform raceme. Ls whitish-gray, silky.—High Alp.; not common. 7 *spicata* Wulf. 1173.
- Stem 60—100 *cm*, woody, terminating in a narrow panicle. Ls gray-pubescent underneath. Cultivated. 8 † *Abrótanum* L. 1174.
- 10^y(5). Ls green and glabr. above, white-tomentose underneath, simply pinnatifid, with lanceolate, rather broad, lobes. —Uncultivated places, road-sides, water side; distrib. 7 *vulgaris* L. 1175.
- Ls tomentose, snow-white, 2—3-pinnatipartite, with narrow-linear lobes.—Uncultivated places, hills. W. 9, 10 *valesiaca* All. 1176.

312. *Tanacétum*. Tansy. XIX, 55.

- 1. Ls 2-pinnatisect, with linear-lanceolate segments, toothed. — Embankments, slopes; distrib. 6 *vulgare* L. 1177.
- Ls undiv., oval, toothed-crenate. *Balsamita* major Desf. --Formerly much cultivated, and sometimes almost spontaneous. 7 † *Balsamita* L. 1178.

313. *Achilléa*. Yarrow. XIX, 62.

- 1. Ray-fls 6—20 (gen. 10), as long as, or longer than, the hemispheric invol. 2
- Ray-fls 3—7 (4—5), only half as long as the gen. ovoid invol. (Ls 2-pinnatisect) 8
- 2. Ls undiv., more or less deeply toothed (sometimes almost pinnatifid) 3
- Ls 1—2-pinnatisect 4
- 3. Ls almost linear, serrate.—Damp places, ditches; distrib. 6 *Ptarmica* L. 1179.
- Ls linear-lanceolate, incised-pinnatifid; with lobes longer than the breadth of the undiv. limb, toothed and more spreading than in the last, decurrent *A. alpina* auct. helv. *A. Ptarmica*—*macrophylla*?—Alp.; found once by Thomas at the exit of the Bedrettothal! 7 * *commutata* Heimerl. 1180.
- 4. Ls oblong-cuneiform in contour, pinnatifid, with oblong, obtuse, entire, or 2—3-toothed, appressed-silken-haired lobes.—Alp.; T. (Mt. Generoso). 7 *Clavenæ* L. 1181.
- Ls 1—2-pinnatisect 5
- 5. Corymb compound. Ls oval in contour, pinnatisect, with inciso-double-toothed segments. Stem 30—70 *cm*. Alp. and subalp. 7 *macrophylla* L. 1182.

- Corymb gen. simple. Ls oblong or narrow-lanceolate in contour. Stem 10—25 *cm* **6**
- 6. Ls narrow-lanceolate in contour; very woolly-villous. Segments numerous, crowded.—High Alp. 7 *nana* L. 1183.
- Ls oblong in contour, glabr. or slightly hairy **7**
- 7. Ls dotted; segments entire or 1-toothed. Iva.—Granite Alps (wanting in St. Gallen and Appenzell). 7 *moschata* Wulf. 1184.
- Ls not dotted; segments 2—3-fid (rarely plurifid).—Alp., especially calc. 7 *atrata* L. 1185.
- 8 (1). Ray-fls golden yellow. Ls woolly-villous.—Uncultivated, sunny places; W. 5, 6 *tomentosa* L. 1186.
- Ray-fls white, yellowish or red **9**
- 9. Ray-fls $\frac{1}{3}$ — $\frac{1}{4}$ as long as the invol. Ls oblong-oval in contour, much broader than in *A. millefolium*; heads smaller.—Hills; T. W. Neuchâtel. 7 *nobilis* L. 1187.
- Ray-fls half as long as the invol. Type of *A. millefolium* **10**
- 10. Ls oblong in contour, broader than in *A. millefolium*, the rad. often very long; rachis winged and (especially towards the top) toothed! *A. magna* Dec.; *A. tanacetifolia* auct. p. not All.; *A. lanata* Koch.—Var. with broader segments (v. *dentifera* Dec.?).—G. T. W. (Hinterrhein! Airolo! Simplon! Saas). 7 *stricta* Schleich. 1188.
- Ls linear, or linear-oblong in contour; rachis narrow, neither winged nor toothed **11**
- 11. Ls rather villous, especially on the back, or glabr.; lobes linear-lanceolate.—Road-sides, grassy places; everywhere. 6 *millefolium* L. 1189.
- Ls woolly-villous, still narrower in contour and more finely div. than the last; lobes numerous, crowded, almost setaceous; heads distinctly smaller and denser. *A. polyphylla* Schleich.—Dry slopes; W. G. (Obervatz). 6; earlier than the last? *setacea* W. K. 1190.

OBS. Hybrids: *A. atrata-macrophylla* (Thomasiana Hall. F.); *A. atrata-moschata* (impunctata Kern., *atrata* v. *intermedia* Gaud. ?); *A. atrata-nana* (Laggeri Schultz); *A. macrophylla-moschata* (Lereschii Schultz); *A. macrophylla-nana* (valesiaca Sut.); *A. moschata-nana* (*intermedia* Schleich., *hybrida* Koch).—*A. millefolia-tomentosa*: valley of Saas according to Schneider; *A. nobilis-setacea*: Favrat.

314. *Anthemis*. Wild Chamomile. XIX, 60, 62.

- 1. Scales of the receptacle obtuse or laciniate at the top. Disk fls with cylindric tube. Roman chamomile.—Cultivated in gardens and sometimes almost subsontaneous. 7 *nobilis* L. 1191.
- Scales of recept. acute, entire. Disk fls with a compressed tube **2**

2. Scales linear-setaceous, gen. only found in the upper part of the recept.; recept. long-conic. Pl. fairly glabr. with a disagreeable smell. *Maruta foetida* Cass.—Fields, waste places; not everywhere (wanting in G.). 5, 6
Cótula L. 1192.
- Scales oblong or lanceolate, found under all the fls 3
3. Recept. at last long-conic. Pl. rather spider-webby, grayish green, with little scent.—Fields; distrib. 5
arvensis L. 1193.
- Recept. rather swollen or hemispheric. . . . 4
4. Ray fls golden yellow.—Waste places; road-sides; J. Z. S. and sometimes adventitious in other places. 6, 7
tinctoria L. 1194.
- Ray fls white, longer than in the last.—T. (Mt. Generoso). 7 **Triumfetti All. 1195.**

315. *Matricária*. Chamomile. XIX, 66.

1. Recept. solid. Heads larger than in the true chamomile, with no scent. *Chrysanthemum inodorum* L.—Fields, rubbish-heaps; not everywhere (wanting in T. U. L.). 6
inodóra L. 1196.
- Recept. hollow. Heads small, with an agreeable scent 2
2. Lobes of the ls linear-filiform, distant. Peduncles long, slender; ray fls white, disk fls with 5 teeth. True chamomile. Surely and easily distinguished from the pls which resemble it, *Anthemis cotula*, *A. arvensis* and *Matricaria inodora* by the recept. being hollow inside, from the 2 former, also, by the want of scales on the recept. Pl. glabr. —Fields, rubbish heaps; distrib. 5 **Chamomilla L. 1197.**
- Lobes of ls linear or linear-lanceolate, crowded. Peduncles short, thickened under the fls. Ray fls 0, disk fls with 4 teeth.—N. America and eastern Asia; naturalised in several places near Constance and Kreuzlingen! 5
***discoidea Dec. 1198.**

316. *Leucánthemum*. Ox-eye-daisy. XIX, 66.

1. Stem 1-headed, or div. into long 1-headed branches 2
- Heads clustered into a corymb. (Ls all pinnatisect) 4
2. Most of the ls rad.; these and the lower caul. pinnatifid, with 5—7 closely crowded lobes, directed forwards; upper ls linear, entire.—b. *minimum* Vill. Pl. small, rough-tomentose.—High Alp.; b. Zermatt. 7
alpinum Lam. 1199.
- Lower ls crenate, irreg. incised or pinnatifid, the upper more or less toothed or incised 3
3. Caul. ls irreg. toothed, the teeth of the base deeper. Stem bearing 1—several heads. Achenes gen. all without pappus. *Chrysanthemum Leucanthemum* L.—b. *atra-*

tum Dec. (*Chrysanthemum montanum* var. c. Koch). Stem low, 1-headed; ray-achenes with pappus.—Fields and pasturages; everywhere; b. Alp., subalp. and Jura. 6

vulgare Dec. 1200.

- Caul. ls almost reg. toothed, acute. Stem 1-headed. Ray-achenes with a, more or less developed, crown of pappus? *Chrysanth. mont. var. b. Koch.**)—T. (S. Giorgio, Mt. Boglia). 6 . . . **heterophyllum Dec. 1201.**

- Ls fleshy, brittle, gen. glabr., deeply incised or pinnatifid. Stem 1-headed, tufted. *Chrysanth. Halleri* Sut.—High Alp., not everywhere (wanting in V. B.). 7

coronopifolium Vill. 1202.

- 4 (1). Segments of the ls in 4—5 pairs, obtuse, incised, the upper confluent. Pl. with an aromatic smell (resembling that of chamomile).—Rubbish-heaps, walls; naturalised. 6

Parthénium Gr. Godr. 1203.

- Segments of ls in 8—15 pairs, those of the upper ls linear-lanceolate, acute, inciso-dentate. Pl. not aromatic.—Mountain woods; not everywhere (wanting in U. L. A.). 6 . . . **corymbosum Gr. Godr. 1204.**

OB3. The genus *Chrysanthemum* (achenes of the edge differently shaped to those of the disk) with 2 species with yellow fls: *Chr. segetum* L. and *Chr. coronarium* (*Pinardia coronaria* Less.) do not belong to this flora.

317. *Doronicum*. *Doronic*. XIX, 73.

- 1. Rad. ls cordate-oval. Rt-stock producing underground stolons swollen here and there into tubercles.—Mountain woods, rare; T. W. V. J. S. 5 **Pardalianches L. 1205.**

318. *Aronicum*. *Aronic*. XIX, 73.

- 1. Lower ls petioled, oval, truncate or slightly cordate at the base, coarsely sinuate-dentate; upper ls oval-oblong, or oval-lanceolate, half-clasping. Stem 20—40 cm, bearing 1—4 heads.—Detritus in the high Alp. **scorpioides Koch. 1206.**
- Lower ls oblong, narrowed into the petiole, sinuate-dentate; the upper with narrowed, more rarely rounded, base. Stem 1-headed, gen. lower. Type of *A. Doronicum Willd.* 2
- 2. Ls rather firm and fleshy. Stem hollow.—High Alp. on primary soil; G. W. O. U. A. 7 **glaciale Rchb. 1207.**
- Ls soft. Stem not hollow.—As the last. G. T. W. O. U. 7 **Clusii Koch. 1208.**

319. *Arnica*. *Arnica*. XIX, 71.

- 1. Stem bearing 1—3 heads, with 1 or 2 pairs of opp. ls. Fl. orange-yellow.—Alp., subalp., also lower; rare in the Jura. 6 **montana L. 1209.**

* The true **L. montanum Dec.** (*Chrys. mont. var. c. Koch*) is found in the more southern parts; it is the same as **L. pallens Dec.** which Nyman reports, by mistake, as being found in Switzerland.

320. **Senécio. Senecio. XIX, 42, 73.**

1. Heads with small bracts at the base, like an outer invol. *Senecio auct.* 2
- Heads with no outer invol. (ls undiv., crenate-dentate or almost entire, the caul. much reduced. Heads 3—15, in a corymb. Achenes hairy). *Cineraria auct.* 18
2. Ls pinnatifid or 1- or 2-pinnatifid, rarely undiv. and then cordate at the base 3
- Ls all undiv., entire or toothed, lanceolate or oblong, the lower ones sometimes oval 15
3. Fls all tubular. Invol.-leaflets black in the upper portion. Achenes hairy.—Cultivated ground, road-sides; everywhere. 4—10 **vulgaris L. 1210.**
- Marginal fls ligulate, ligules narrow, rolled back 4
- Marg. fls ligulate, ligules broader, spreading (rarely 0 in 1216 and 1218) 5
4. Leaflets of the outer invol. loose, half as long as the invol. Achenes, at last, glabr. Pl. glandular-viscous.—Stony places, wood-clearings; distrib. (wanting in L.). 6 **viscosus L. 1211.**
- Leaflets of the outer invol. appressed, about $\frac{1}{6}$ the length of the invol. Achenes gray-hairy. Pl. not, or scarcely, glandular.—Wood-clearings, congregated; 6, 7 **sylvaticus L. 1212.**
- 5 (3). Ls glabr., webbed-woolly, or slightly gray-tomentose underneath; petiole gen. auricled. 6
- Ls (pinnatifid or incise-crenate) white-tomentose on both sides; petiole not auricled. (Alpine pls of 3—10 cm in height.) Type of *S. incanus* 13
6. Ls undiv., slightly gray-tomentose underneath, the lower cordate-oval. Achenes glabr. *S. cordatus* Koch.—Alp. and subalp., especially near châteaux; wanting in the Jura. 6 **cordifolius Clairv. 1213.**
- Ls pinnatifid or 1- or 2-pinnatifid, or lyrate and undiv., but never cordate 7
7. Leaf-rachis toothed. Ann. or bienn. pls. Invol.-leaflets long, black at the top, *S. laciniatus* Bert.—Subalp. G. (Engadine, Münsterthal). 7 **nebrodensis L. 1214.**
- Rachis not toothed. (Perenn., rarely bienn., pls) 8
8. Ls glabr., 2-pinnatisect, with narrow linear segments. Fls orange-yellow.—High Alp.; G. T. A. (eastern Switz.). 7 **abrotanifolius L. 1215.**
- Ls glabr. or hairy, lyrate-pinnatifid or simply pinnatisect 9
9. Leaflets of the outer invol. 4—6, about half as long as the invol. Rt-stock creeping (up to 15 cm). Ls more or less gray-webbed, all pinnatifid, the upper with small

- auricles, entire or 2-fid. Achenes all pubescent.—Road-sides, slopes; more common in western than in eastern Switz. 7, 8, later than *S. Jacobæa erucifolius* L. 1216.
- Leaflets of the outer invol. gen. only 1—2, several times shorter than the invol. Rt-stock short, at last præmorse **10**
10. Ls slightly gray-webbed underneath, lyrate, with a very large terminal segment. *S. subalpinus* Reut. ex Rap.; *S. cordifolius*-*Jacobæa*.)—Among the parent pls, but by preference in eastern Switz. 7 **lyratifolius* Rchb. 1217.
- Ls glabr. underneath or slightly webbed-woolly. Achenes, at least those of the circumference, glabr. Type of *S. Jacobæa* **11**
11. Achenes of the disk very villous. Lower ls gen. withered at flowering-time, the middle ones pinnatifid with lobes separating from the rachis almost at a right-angle, with multifid auricles.—Var. like 1216 with ray-fls short or (*v. flosculosus* Jord.) 0.—Road-sides, hills; distrib., but rarer in western Switz. 6, 7. *Jacobæa* L. 1218.
- Achenes of the disk glabr. or faintly pubescent. Lower ls gen. still green at flowering-time, the middle ones lyrate-pinnatifid, (the lower sometimes undiv.) **12**
12. Stem terminated by a corymb, with erect-spreading branches. Ls light green; lateral segments springing obliquely from the rachis. Stem lower than in the last; heads larger. *S. pratensis* Richt. (a larger form).—Damp fields; not everywhere (wanting in G. L.). 6; earlier than the last *aquaticus* Huds. 1219.
- Stem div. almost to the middle, almost in a corymb with spreading or divergent, long, unequal, fairly leafless branches. Ls dark green; lateral segments springing almost at a right angle or slightly bent forwards. Heads smaller than in the last. *S. erraticus* Bert.—Miso: Brügg.; Gex, not far from Genève: Michalet. 7, later than the 2 last *barbareifolius* Krock. 1220.
- 13 (5). Stem 1-headed, head large, rarely 2—3 rather smaller heads. Invol.-leaflets rather pointed. Achenes villous. Ls very white-tomentose.—High Alp.; W. (Simplon, Saas, Zermatt). 7 *uniflorus* All. 1221.
- Stem with several heads smaller than in the last; achenes glabr., rarely slightly pubescent at the top **14**
14. Ls white-tomentose.—High Alp.; T. W. O. U. 7
incanus L. 1222.

*) Gremlich distinguishes, in the Tyrol, a *S. Reischii* (cord.-*Jacobæa*) achenes glabr. at the edges, and a *S. lyratifolius* (cord.-*erucifol.*), all the achenes pubescent.

- Ls gray with appressed, almost silken, tomentum, finally almost glabr., less div. and less distinctly narrowed into the petiole than in the last.—High Alp.; G. T. 7

carniolicus Willd. 1223.

- 15 (2). Ray-fls 4—8. Leaflets of the outer invol. 3—5. Type of *S. nemorensis* **16**

- Ray-fls 10—20. Leaflets of the outer invol. 10 or more **17**

16. Ls shortly pubescent underneath, the middle and upper ones narrowed suddenly into a petiole which is broadly winged, dilated and half-clasping. Invol. campanulate-cylindric. Achenes almost as long as the pappus.—Woods, gorges, confused with the following and, in consequence, the localities still uncertain! 7

Jacquinianus Rehb. *) 1224.

- Ls fairly glabr., the upper ones with a short, winged petiole, not, or scarcely, dilated at the base. Invol. short-cylindric, slenderer than in the last. Achenes shorter than the pappus. Stem gen. red. *S. sarracenicus* L. ex Godr. and Kern. nec auct. pl.—As the last, and, as it appears, more common but later . **Fuchsii Gmel. 1225.**

17. Stem 90—150 cm, many-headed. Ls long-lanceolate.—Marshy fields, edges of rivers and brooks; distrib. (wanting in G.). 7 **paludosus L. 1226.**

- Stem 20—50 cm, bearing 1—3 (rarely more) heads, heads large. Lower ls oval, upper oblong.—Rocky places of the Alp.; Suchet and Dôle in the Jura. 6 **Doronicum L. 1227.**

- 18 (1). Fls orange-yellow (very rarely yellow). Invol.-leaflets red-brown all over, or at any rate at the top.—Alp.; T. V. B. O. U. A. G. **aurantiacus Dec. 1228.**

- Fls yellow. Invol.-leaflets green or spotted at the top **19**

19. Rad. ls almost truncate at the base (occasionally also slightly cordate) and narrowed into a broadly winged petiole, only as long as, or shorter than, the petiole.—*b. tenuifolius* Gaud. (*brachychætus* Dec.?) Ls less hairy, the rad. more gradually narrowed to the base; heads more dense (*Lavirum*).—Mountain woods and swamps; rare; G. V. B. J. S. 5 **spathulæfolius Dec. 1229.**

- Rad. ls narrowed rather insensibly into a narrowly winged petiole, the majority longer than their petioles.—Calc. mountains of central Jura, rare. 6

campestris Dec.

OBS. Hybrids: *S. incanus-uniflorus* (*oligocephalus* Näg., *Laggeri* Schultz bip.) See N. Beitr. I, 45. *S. abrotanifolius-incanus*, reported from Camoghe.

*) The variety **octoglossus Dec.** (*nemorensis* Rehb. Gaud.) has ray-fls to the number of 7—8 (instead of 4—6), it is found according to Godet at Locle.

321. **Caléndula. Marigold. XIX, 64.**

1. Lower ls spatulate, upper oblong-lanceolate. Fls orange-yellow.—Ornamental pls, sometimes subsontaneous. 6
† *officinalis* L. 1231.
- Ls all oblong-lanceolate or lanceolate. Fls yellow.—Fields; very rare and only accidentally and in a transient manner (Bienne, Bâle). 6 . * *arvensis* L. 1232.

322. **Echinops. Globe Thistle. XIX, 25.**

1. Stem 80—120 *cm*, 1-headed, or branched with gen. 1-headed branches. Heads large, globular.—Uncultivated ground, road-sides; W.; also sometimes accidentally. 7
sphærocéphalus L. 1233.

323. **Cirsium. Fuller's Thistle. XIX, 34.**

1. Ls rough on the upper face with small spines . . . 2
- Ls glabr. or hairy above but not spiny . . . 4
2. Ls decurrent. Heads ovoid, 3½ *cm* long.—b. *nemorale* *Rchb.* Ls very white and cottony underneath, with shorter and broader segments. Heads rather globular.—Road-sides, waste ground, woods; everywhere. 6
lanceolatum Scop. 1234.
- Ls not decurrent. Heads globular (up to 7 *cm*, the largest of the genus). Type of *C. eriophorum* L. . . . 3
3. Invol.-ls little, or scarcely, enlarged below the terminal spine. Heads gen. densely webbed, cottony.—Mount. and subalp.; not everywhere (wanting in U. Z. A.). 6
eriophorum Scop. 1235.
- Invol.-ls suddenly enlarged below the spiny point into an almost rounded, spatulate-concave, appendage pectinate-ciliate at the edges. Heads often less densely webbed. A poor species and inclined to approach the last.—Tess. 6
spatulatum Gaud. 1236.
- 4 (1). Fls, by suppression, partly diœcious. Pappus finally longer than the cor. Stem gen. branching from the base, terminating in a many-headed corymb. Rt-stock or rt. creeping at a great depth.—Fields and wood-clearings, a troublesome herb. 7 *arvense* Scop. 1237.
- Fls all hermaphrodite. Pappus shorter than the cor. Stem not branched in its lower portion 5
5. Stem crisp-winged up to the top on account of the entirely decurrent ls. Heads small. clustered. *C. Chailleti* Gaud. not Koch (forma putata).—Damp fields, marshes; everywhere. 7 *palustre* Scop. 1238.
- Ls not, or scarcely, decurrent 6
6. Fls red 7

- Fls pale yellow or yellowish white (rarely in *C. oleraceum* and *C. Erisithales* tinged with red) **10**
7. Ls very white-tomentose underneath, glabr. above, undiv. or inciso-pinnatifid, with narrow lobes, strongly inclined forwards.—Alp.; G. T. W. U. 6
heterophyllum All. 1239.
- Ls green underneath or with a slight gray-webbed tomentum **8**
8. Stem stunted, apparently 0 and the head sessile on the spreading rosette of ls, rarely (v. *caulescens*) up to 15 cm and more, and then leafy throughout its whole length. Cor.-limb distinctly shorter than its tube.—Pasturages, fields, especially of the mount. and subalp. 6
acaule All. 1240.
- Stem 30—100 cm, leafless in the upper portion. Cor.-limb longer than the tube **9**
9. Rt-fibres thickened in the middle like a spindle. Ls with a slight gray-webbed tomentum underneath, not clasping or half-clasping, pinnatifid or -partite, with 2—3-lobed divisions. Stem bearing 1—3 (rarely several) heads, on long peduncles.—Damp fields; Geneva. J. Z. 7
bulbosum Dec. 1241.
- Rt-fibres filiform. Ls of the same colour on both sides, auricled-clasping, undiv., or toothed or deeply pinnatifid, with lobes never div. Heads gen. 2—4, clustered, rarely solitary and with long peduncles.—As the last; especially Jura and subalp.; fairly distrib. (wanting in G.). 7 **rivulare Link. 1242.**
- 10 (6). Stem not leafy in the upper portion. Heads drooping, not surrounded by floral ls. Invol.-ls keeled, glutinous. Ls pinnatifid with numerous segments which are lanceolate and gen. spread at a right angle.—Alp., subalp. and Jura (wanting in W.). 7 **Erisithales Scop. 1243.**
- Stem leafy up to the top. Heads erect, enveloped in fl.-ls **11**
11. Fl.-ls (large, of a dirty green) oval, undiv. Invol.-ls terminated by a short soft spine.—Damp fields; ditches; everywhere. 7 **oleraceum Scop. 1244.**
- Fl.-ls long, lanceolate, spiny, pinnatifid. Invol.-ls terminated by a long, strong spine.—Alp. 7
spinosissimum Scop. 1245.

OBS. The numerous hybrid forms of this genus admit of the following classification:

1. Ls with small spines on the upper face:
C. acaule-lanceolatum (*sabaudum* Ruhmer); *C. eriophorum-lanceolatum* (Gerh. Schultz bip.); *C. lanceolatum-oleraceum* (*bipontinum* Schultz); *C. subulatum* Gaud. is, according to Rapin, *C. oleraceum*). *C. lanceolatum-palustre* (*subspinuligerum* Peterm.).

2. Ls without spines on the upper face.

a. Ls more or less decurrent.

aa. Fls red.

§. Cor.-limb longer than the tube:

C. bulbosum-palustre (semidecurrrens Rehb.). *C. Erisithales-palustre* (*C. Huteri* and *Ausserdorferi*, Hausm.); *C. palustre-rivulare* (sub-alpinum Gaud.); *C. palustre-spinosissimum* (foliosum Rhin.).

§§. Cor.-limb as long as the tube:

C. acaule-palustre (*C. Kirschlegeri* Schultz bip.).

bb. Fls yellowish white, or white, sometimes slightly tinged with red towards the top.

† Cor.-limb longer than the tube:

C. oleraceum-palustre (hybridum Koch).

†† Cor.-limb shorter than the tube, 5-fid above the middle: *C. arvense-oleraceum* (sessile Peterm., *Reichenbachianum* Lohr).

b. Ls not decurrent.

* Heads without fl.-ls. Fls red.

§. Cor.-limb distinctly shorter than the tube: *C. acaule-heterophyllum* (alpestre Näg.).

§§. Cor.-limb longer than the tube: *C. acaule-bulbosum* (medium All., *Zizianum* Koch); *C. acaule-rivulare* (Heerianum Näg.); *C. bulbosum-rivulare* (Brunneri A. Br.); *C. Erisithales-heterophyllum* (Tappeineri Rehb. f.); *C. heterophyllum-rivulare* (ambiguum All. nec Koch).

** Heads surrounded by fl.-ls. Fls yellowish white or white, sometimes tinged with red at the top: *C. acaule-oleraceum* (rigens Wallr., decoloratum Koch); *C. acaule-spinosissimum* (fissibracteum Peterm.); *C. bulbosum-oleraceum* (Braunii F. Schultz); *C. Erisithales-oleraceum* (Candolleianum Näg., elatum Saut.); *C. heterophyllum-oleraceum* (affine Tausch.); *C. heterophyllum-spinosissimum* (autareticum Treuinfels, Cervini Koch, Hallerianum Gaud., purpureum All ?); *C. oleraceum-rivulare* (præmorsum Michl., erucagineum Dec.); *C. oleraceum-spinosissimum* (Thomasii Näg.).

Also: *C. acaule-Erisithales* (tiroliense Treuinf.); *C. Erisithales-spinosissimum* (flavescens Koch, Gauderi Hut.).—Of ternary hybrids the following have been observed: *C. acaule-oleraceum-rivulare* (Jouxthal according to Nägeli); and *C. Erisithales-oleraceum-palustre* (spontaneous form in the botanical garden at Zürich).

324. *Silybum*. Milk Thistle. XIX, 32.

1. Ls large, spotted with white. Invol.-ls reflexed, spiny. —Waste ground near dwellings; W. (Sion, Branson); otherwise occasionally adventitious 7

Marianum Gärt. 1246.

325. *Carduus*. Thistle. XIX, 35.

1. Heads oblong or ovoid-oblong, decid. at maturity. (Ls pinnatifid, with broad, angular lobes, webbed-white-tomentose underneath.) Type of *C. pycnocephalus* 2
- Heads globular or ovoid, not decid. at maturity. 3
2. Middle invol.-ls rather broad at the base, then rather suddenly narrowed, without marginal nerves; dorsal nerve in the lower part 0. Heads sessile, in clusters of 3 and more.—Geneva! 6 . *tenuiflorus* Curt. 1247.*)

*, *C. microcephalus* Gaud. not Ten., (syncephalus Rehb.) which was formerly found in Upper Wall. is probably connected with this species. On the other hand *C. tenuiflorus* Gaud. syn. appears rather to be a *C. pycnocephalus*.

- Middle invol.-ls narrow at the base, narrowed insensibly, with a marginal nerve; dorsal nerve prolonged to the base. Heads isolated or in clusters of 2—3, sessile or peduncled, gen. rather larger than in the last.—Geneva! 6
pycnocéphalus Jacq. 1248.
- 3. Middle invol.-ls broad, lanceolate, narrowed below the centre and folded back transversely. Heads large (4 cm and more broad), depressed-globular. Type of *C. nutans* 4
- Middle invol.-ls narrower, linear, or linear-subulate, appressed or arched outwards. Heads medium sized or small, ovoid 5
- 4. Heads solitary, drooping (rarely erect!). Upper part of the invol.-ls gradually and insensibly narrowed to a point.—Rubbish-heaps, road-sides; distrib. 7
nutans L. 1249.
- Heads solitary, erect, or in pairs and then one sessile, horizontal. Upper part of the invol.-ls broad even at the top, narrowed to a point in a slight curve.—Chur, Lower Engadine: Brügg. 7 **platylepis Saut.! 1250.**
- 5. Stem and branches terminating in a long peduncle, leafless and 1-headed. Ls gen. glabr. underneath.—*b. crassifolius Willd. Gaud.* (summanus Poll., Argemone Schl.) Ls slightly thickened, sea-green underneath, ciliate with weak spines.—*c. rhæticus Dec.* (carlinæfolius Gaud. not Lam., transalpinus Sut.) Ls deeply pinnatifid, with longer and stronger spines, segments and wings crisp; invol.-ls more gradually narrowed into a small spine which is more distinct than in a. and b.—Stony slopes, especially of the mount. and subalp.; distrib.; b. Tess., Simplon; c. Graub., Tess., Wall. 7 **defloratus L. 1251.**
- Stem and branches with crisp wings up to, or almost up to, the heads; heads gen. clustered into a ball 6
- 6. Ls light green, firm, green underneath, pinnatifid or sinuate-pinnatifid, with numerous spines of a yellowish colour, 6—7 mm long and very piercing. Heads rather larger and less dense than in *C. crispus*.—Road-sides, rubbish-heaps; doubtful or at any rate very rare in Switz. 7 **acanthoides L. 1252.*)**
- Ls with shorter and less, or scarcely, piercing spines 7
- 7. Ls gen. all sinuate-pinnatifid, more or less webbed, gray- or white-tomentose underneath, rarely.—*b. multiflorus Gaud.* (polyanthemus Schl.) green. Bienn. pl. re-

*) *C. axillaris Gaud.*, which Dec. and Bert. connect with this species is a *C. crispus-defloratus*, judging at any rate by examples belonging to E. Thomas. In the same manner *C. acuminatus Gaud.*, which Koch connects with *C. acanthoides*, at least the specimens collected near Bex by E. Thomas. *C. acanthoides E. Thom.* (from the Simmenthal!) is probably a form of *C. defloratus*.

sembling *Cirsium palustre* from which it is distinguished by the pappus hairs which are not plumose.—Road-sides, rubbish-heaps; almost everywhere; b. mountains and subalp.; Jouxthal, Saanethal, Graub.? 7 **crispus** L. 1253.

- Ls softer than in the last, gray-tomentose underneath, the lower large, lyrate-pinnatifid, the upper undiv., only toothed. Perenn. pls (rt-stock creeping). Wings of the stem narrower than in the last; outer ls of the invol. much longer.—Damp thickets and the sides of torrents; Alp., subalp. and Jura, also lower. 7 **Personata** Jacq. 1254.

OBS. Hybrids: *C. crispus-defloratus*; *C. crispus-nutans* (C. Stangii Buck, polyacanthus Heg.); *C. crispus-Personata*; *C. defloratus-nutans* (Brunneri A. Br.); *C. defloratus-Personata* (Bambergeri Hauser); *C. nutans-Personata* (Grenieri Schultz. bip.).

326. *Onopordon*. *Onopord*. XIX, 44.

1. Stem broadly winged by the decurrent ls. Heads very large.—Dry, waste places; not everywhere (wanting in U. L. A.). 7 **Acanthium** L. 1255.

327. *Lappa*. *Bur*. XIX, 31.

1. Inner invol.-ls red, rather obtuse with a short superposed point. Heads gen. much webbed, very much depressed at the base, in a rather dense corymb.—Rubbish-heaps, embankments; not everywhere and in western Switz. almost exclusively in the subalp. 8 **tomentosa** L. 1256.
- Invol.-ls all terminated by a hooked point, or the inner ones only narrowed to a straight, subulate point. Heads glabr. or little webbed, not, or faintly, depressed at the base 2
2. Heads arranged in a lax corymb (lower branches of the inflorescence long), fairly large. Invol.-ls all green. Petioles of the rad. ls solid. L. major Gärtln.—As the last; fairly distrib. 8 **officinalis** All. 1257.
- Heads in a raceme or almost in a corymb (the upper dense). Inner invol.-ls, or all, reddish in the upper part. Petioles of rad.-ls hollow. Type of *L. minor* 3
3. Heads rather small, about the size of a nut. Invol.-ls exceeded by the fls. Achenes 5—7 mm long. Stem 50 to 70 cm with erect-spreading branches.—b. *pubens* Bor. Heads rather larger, with longer peduncles.—c. *alba* Christ. ined. Heads smaller, fls dark red, ls white-tomentose underneath.—As the last; distrib. b. W. V. c. Sion. 8 **minor** Dec. 1258.
- Heads about as large as in 1257 (but often partly suppressed). Invol.-ls about as long as the fls, broader than in the last. Achenes 8—11 mm long. Stem 100—300 cm, with spreading, finally almost pendant, branches. L. in-

termedia Rchb. *f.*, *macrosperma* Wallr.—Woods, on calc., many growing together; W. V. J. S. and probably in other parts also! 7, earlier than the last

nemorosa Körnik. 1259.

328. *Carlina*. *Carline*. XIX, 29.

1. Stem always simple and 1-headed, gen. stunted, apparently 0, and the large head (5—8 *cm* in diam.), so to speak, sessile on the rosette of ls, or (*v. caulescens*) stem up to 30 *cm* long. Ls all petioled, deeply sinuate-pinnatifid.—Pasturages, mountain slopes; distrib. 7
acaulis L. 1260.
- Stem simple or branched, 20—45 *cm*, bearing 1—several heads. Ls sinuate-dentate, the upper sessile . . . 2
2. Ls oblong-lanceolate, spiny, sinuate-dentate.—As the last. 7
vulgaris L. 1261.
- Ls lanceolate, longer than in the last, with irreg. spiny teeth, spines less spreading. *C. nebrodensis* Koch not Guss.!—Alp., rare. V. B. (Morcles, Mortais, Mérils). 7
longifolia Rchb. 1262.

329. *Saussurea*. *Saussurea*. XIX, 34.

1. Ls with a gray- or whitish-webbed tomentum underneath, entire or slightly toothed, the rad. oblong-lanceolate, with rounded or narrowed base.—*b. depressa* Gren.? Stem stunted, ascending; ls broader, more distinctly toothed.—Alp. (wanting in T. A.). 7
alpina Dec. 1263.
- Ls snow-white underneath, tomentose, slightly sinuate-dentate, the rad. oval-oblong with cordate base.—Alp. (wanting in V. B.). 7 . . . *discolor* Dec. 1264.

330. *Serrátula*. *Saw-wort*. XIX, 37.

1. Invol.-ls dilated at the top into a scarious, broad, oval appendage. Ls gen. undiv., gray-tomentose underneath. Stem 50—60 *cm*, 1-headed; head very large. *Rhaponticum scariosum* Lam.—*b. helenifolia* Gren. Stem more reg. leafy; invol.-appendages not ciliate. (Alvier, Rhätikon). —Alp. G. W. V. A. 7 . . . *Rhaponticum* Dec. 1265.
- Invol.-ls without appendage. Ls glabr. or almost so 2
2. Stem 1-headed; head fairly large. Invol. almost globular. Ls entire or slightly toothed.—Rocky places; Salève near Geneva. 6, 7 . . . **nudicaulis* Dec. 1266.
- Stem bearing several or many heads; heads small. Invol. oblong-cylindric. Ls undiv., or lyrate or pinnatifid. —*b. Vulpii* Fisch.-Oost. (*monticola* Bor.) Alpine form

with fewer, larger, and denser heads, and lower stem
—Damp fields, thickets; distrib. 7 **tinctoria** L. 1267.

331. *Kentrophyllum*. *Kentrophyllum*. XIX, 36.

1. Ls sinuate-pinnatifid. Outer ls of the invol. spiny, like the upper caul.—Dry, stony places. W. V. 7
lanatum Dec. 1268.

332. *Centaurea*. *Centaury*. XIX, 38, 52.

1. Invol.-ls terminated by a palmatifid spine, 12—20 mm long and div. into 5—7 spines 2
- Invol.-ls without this spine, but terminated by a scarious, coloured edge 3
2. Fls lemon-yellow. Caul. ls decurrent, linear-lanceolate, entire, the lower lyrate.—In lucern-fields, introduced with foreign grain, rare and uncertain. 7, 8
solstitialis L. 1269.
- Fls red. Caul. ls not decurrent, pinnatifid, with linear lobes, except those at the tops of the stems and branches which are entire.—Uncultivated places, road-sides; V. otherwise sometimes adventitious. 7 **Calcitrapa** L. 1270.
3. Fls, at any rate of the margin, blue (rarely rose or white) 4
- Fls red or white 6
4. Caul. ls not decurrent. Ann. pls. Cornflower.—Corn-fields; distrib. 6 **Cyanus** L. 1271.
- Caul. ls decurrent. Perenn. pls 5
5. Invol.-ls with black edges, pectinate-dentate; teeth about as long as the breadth of the scarious edge. Ls rather cottony-webbed, green.—Mountain woods, gorges; distrib. 6 **montana** L. 1272.*)
- Invol.-ls with light brown edges, pectinate-fringed; fringes often silvery, nearly twice as long as the breadth of the scarious edge. Ls webbed-tomentose, often sinuate-dentate. Stem gen. bearing several heads. *C. seusana* Gaud. not Chaix.—As the last; T. W. (Berisal). 6
axillaris Willd. 1273.
- 6 (3). The scarious edge at the top of the invol.-ls forming a distinctly separate appendage 7
- The scarious edge of the invol.-ls toothed-fringed, but not developed as a separate appendage 14
7. Ls 1- or 2-pinnatifid, with linear lobes. Appendage of the invol.-ls white-scarious, swollen-concave, mucronate. *C. splendens* Gaud. Koch.—Stony, dry places in Italian Switz. 7 **alba** L. 1274.

*, *C. lugdunensis* Jord. has rt-stock without stolons and narrower ls, reported from Reculet.

- Ls undiv. or the lower sinuate-pinnatifid 8
8. Pappus 0 or rudimentary. (Appendages of the invol.-ls erect or loosely erect, rarely with their points bent outwards.) Type of *C. Jacea* 9
- Pappus present, at least $\frac{1}{6}$ as long as the achene. (Appendages of invol.-ls fringed-plumose.) 11
9. Appendages undiv., finely denticulate or lacerated, more rarely (v. semipectinata) the lower reg. pectinate-fringed and then the narrowed tip is slightly bent outwards.—
a. *genuina*. Branches short, fairly thick, almost erect; ls green, elliptic-lanceolate.— b. *angustifolia* Schrank: (amara auct. rec. an L.?*) Branches more numerous, longer, slenderer, more spreading; ls gen. gray-webbed, narrower, the upper almost linear, the fl.-ls shorter than the invol. Bloom later.—Fields, pasturages, road-sides; everywhere; b. dryer places, not everywhere, by preference in warmer parts. 8, 9 *Jacea* L. 1275.
- Appendages, with the exception of the outer leaflets, fringed-pinnate 10
10. Appendages almost entirely hiding the invol., of a more or less light brown colour. Differing from *C. nigra* in the presence of barren marginal fls (which are rarely wanting), in the lighter coloured appendages, not completely hiding the invol., less reg. fringed, with narrower fringes and broader disk, and in the pappus being either 0 or extremely short and brittle. *C. nigrescens* auct. mult. not Koch.—Rather damp pasturages; Bâle! Kreuzlingen! and probably also in other places. 7, 8
pratensis Thuill. 1276.
- Appendages blackish, not hiding the invol. *C. nigrescens* Koch.—a. *Candollii* Koch. Appendages large, to a fair extent hiding the invol., so that the invol. appears darker, often almost black. See N. Beitr. III, 11.—
b. *Kochii* F. Schultz (vocchinensis Bernh.!) Appendages small, distant, triangular, so that the invol. appears variegated with green and black.—Only on the other side of the Alps. a. Val Bedretto, Zwischbergen; b. distrib. in Tess. 7 *transalpina* Schl. 1277.
- 11 (8). Barren marginal fls 0 (rarely present). Appendages lanceolate, upright or loosely upright, black-brown, entirely hiding the invol. Pappus $\frac{1}{6}$ as long as the achene.
—a. *obscura* Jord. Stem gen. simple; invol. almost globular.—b. *nemoralis* Jord. Stem gen. taller, branchy; invol. ovoid, with narrower leaflets.—Hills, road- and wood-sides; not everywhere (wanting in G. U. S.). 7. b. later
nigra L. 1278.

*) **C. Gaudini Boiss.** is an extreme form of this variety or subspecies with shining, almost white appendages.

- Barren marg. fls gen. present. Appendages lanceolate, long-subulate, spreading or gen. reflexed. Pappus $\frac{1}{4}$ or $\frac{1}{3}$ the length of the achene. Type of *C. phrygia*: species distinguished by the plumose invols, resembling a periwig! 12
12. Invol. oblong. Appendages light (rarely dark) brown, not hiding the invol. (which makes it appear variegated), with rather distant fringes. Stem and ls glabr. or finely webbed. Stem ascending, slender, often branched from the base, 10—15 cm. Ls rather stiff, narrow, long, glabr. above. *C. Moritziana* Heg., *austriaca* Koch p. p.—Calc. rocks of mount. and subalp.; G. (Oberhalbstein, Filisur, Schmitzen &c.), also by the lake of Como and in south-western Tyrol. 7 *rhætica Moritzi*. 1279.
- Invol. ovoid or almost globular. Appendages almost entirely hiding the invol., with close fringes. Stem and ls rather rough with short, jointed hairs 13
13. Stem 10—30 cm, almost always 1-headed. Ls oblong with base of equal breadth, truncate or almost auricled. Heads large. Appendages gen. light brown. *C. phrygia* Rchb. not L.—b. *Thomasiana* Grml. (ambigua Thom. not Guss., *Ferdinandi* Gren.?) Pl. smaller, more hairy; stem ascending, bearing as many as 4 heads; ls deeply sinuate (Simplon, Binnthal, Saas, Eringerthal).—Alp. G. T. W. V. U *nervosa* Willd. 1280.
- Stem 40—70 cm, often branchy. Ls oblong-elliptic, coarsely toothed, narrowed towards the base. Heads of medium size. Appendages black-brown as in *C. nigra*. *C. austriaca* Rchb. not Willd., *phrygia* Koch not L.*)—G. (Lower Engadine). 7 *pseudophrygia* C. A. Mey. 1281.
- 14 (6). Invol.-ls distinctly 5-nerved. Umbilicus glabr. Rad. ls gen. 2-pinnatifid, with linear lobes. Type of *C. paniculata* 15
- Invol.-ls without nerves or faintly nerved. Umbilicus bearded. Ls simply (rarely doubly) pinnatifid, with narrower or broader lobes, sometimes also partially almost entire. Type of *C. Scabiosa* 17
15. Invol. pale yellowish brown, about 8 mm long, oblong, narrowed at the base. Invol.-ls narrow, acuminate on account of the long, strong, almost spiny terminal fringe. *C. polycephala* Jord.—Waste places; only near Nyon, if still there? 7 *paniculata* L. 1282.
- Invol. distinctly larger, 10—15 mm, ovoid or ovoid-globular, rounded at the base. Invol.-ls broader than in the last, less acuminate on account of the terminal fringe being shorter and weaker 16

*) The true *C. phrygia* L. (*austriaca* Willd. and Koch p. p.) which is found in Bohemia, Silesia and Prussia is, otherwise, little different.

- OBS. Hybrids: *C. Jacea-nervosa*; *C. Jacea-rhætica*.

*) **C. spinulosa** Roch., taller, up to 1 1/2 m; heads smaller, supported by slenderer, longer peduncles; scarious edge of the invol.-ls narrower, with more distant, much shorter, fringes: Yvorne, in company with C. Scabiosa; (adventitious); Jaccard!

337. **Arnóseris. Arnóseris. XIX, 5.**

1. Ls rad., oblong-obovate, toothed. Stem bearing 1—3 heads, red in the lower portion, with branches thickened to the form of a club below the fl. Heads small.—Fields, especially on sandy soil, rare; V. B. Z. S. 7
minima Link. 1292.

338. **Cichórium. Chicory. XIX, 3.**

1. Fl.-ls lanceolate.—Road-sides; everywhere; a larger form with fleshy, carrot-shaped root is cultivated. 7, 8
Intybus L. 1293.
- Fl.-ls broad-oval. Cultivated for salad. 7
† Endivia L. 1294.

339. **Thrinicia. Lesser Hawkbit. XIX, 12.**

1. Ls rad. Stems 1-headed. Invol.-ls edged with black.—Damp, grassy places, fields; Tess., Vaud, Geneva. 7
hirta Roth. 1295.

340. **Leóntodon. Hawkbit. XIX, 12.**

1. Stem gen. branchy and bearing several heads, stunted and alpine pls are also sometimes 1-headed. Peduncles thickened under the fls and furnished in that part with several scales. Outer ligules streaked with red underneath —b. *pratensis* Link (alpestris Heg. if the stem is at the same time 1-headed). Invol. and upper part of the peduncle villous, with blackish hairs.—Pasturages, road-sides; everywhere (Engadine, St. Bernard). 7, 8
autumnalis L. 1296.
- Stem simple and 1-headed, only by exception forked and 2—3-headed 2
2. Root truncate, horizontal or oblique, with strong fibres 3
- Root long-fusiform, descending vertically, with hair-like fibres 5
3. Stem 3—10 cm, scarcely longer than the ls, with 1 or 2 scales above, and villous, like the invol., with blackish hairs. Pappus snow-white. Hairs of the ls (if present) simple.—High Alp. 7 **Taráxaci Loisl. 1297.**
- Stem 10—40 cm, gen. distinctly longer than the ls. Pappus dirty white or brownish 4
4. Stem with several scales above. Petioles narrow, distinct. Hairs of the ls (when present) simple. Fls yellow or (v. *aurantiacus*) safron yellow.—Alp. 7
pyrenaicus Gouan. 1298.
- Stem without scales, or with only 1—2. Petioles fairly broad. Hairs of ls (when present) 2—4-forked.—a. *ge-nuinus*. Ls sinuate-dentate, more or less abundantly

- hairy.—b. *hastilis* L. The same, but ls glabr. or nearly so.—c. *hyoserioides* Welw. Ls pinnatipartite almost to the middle nerve, with narrow, and gen., glabr. segments.—d. *pseudocrispus* Schultz bip. (*crispus* auct. helv. not Vill.). Ls pinnatifid, with undulated crisp segments, very hispid.*)—Meadows and pasturages, up to the Alps; c. well characterised, especially in the Engadine; d. Engadine, Binn, Brée, Simplon, Saas, Zermatt. 6, 7 **hispidus** L. 1299.
- 5 (2). Ls sinuate-dentate or pinnatifid, hispid in consequence of rather long, 3-forked hairs. L. saxatilis Rehb.—Dry calc. mountains; southern Tyrol; reported from Tess. 6
* **crispus** Vill. 1300.
- Ls denticulate or almost entire, gray-tomentose with very short, 3—4 forked, almost stellate hairs . . . 6
6. Ls entire or distantly denticulate; hairs very short so that the ls appear gray-tomentose. Pappus-hairs all plumose.—Sunny, rocky slopes, up to the Alp.; G. U. T. Glarus (Alvier). Eastern Switz. 7
incanus Schrank. 1301.
- Ls narrower and longer than in the last, sinuate-dentate, with distant teeth. Hairs rather longer and less abundant, which shows the green colour of the ls better. Outer pappus-hairs shorter, rough (not plumose).—Tess. (Salvadore, Calbege). 7 . . . **tenuiflorus** Rehb. 1302.
- OBS: Hybrid: *L. pyrenaicus-Taraxaci*.

341. *Picris*. *Picris*. XIX, 13.

1. Stem leafy, terminated by a corymb of several heads. Ls oblong-lanceolate, sinuate, half-clasping. Pl. hispid with hairs partially hooked.—Var. with narrower, almost entire, ls, and earlier bloom (b. *Villarsii* Jord.), with invol.-ls darker, less spreading (c. *umbellata* Nees*).—Meadows, pasturages, road-sides; everywhere; b. T. W. V. B.; c. S. Z. and probably other places also. 7
hieracioides L. 1303.

342. *Helmintha*. *Helminth*. XIX, 13.

1. Stem leafy. Ls clasping, with cordate base. Outer invol.-ls cordate-oval, inner with a pectinate-ciliate awn below the top.—Lucern fields; rare and uncertain. 7, 8
* **echioides** Gärt. 1304.

343. *Tragopogon*. *Goat's-beard*. XIX, 9.

1. Fls violet. Surface of the fl.-head flat. Otherwise as in *T. major*.—Sometimes cultivated † **porrifolius** L. 1305.

*) This variety, as also the **var. opimus** Koch (ls broader, stem lower, thickened at the top) are deserving of further examination!

) A form which perhaps constitutes a distinct species is: **P. pyrenaica L. hair softer; ls broader, flatter; heads larger. Alp. and subalp.

- Fls yellow 2
- 2. Fls gen. dark yellow and distinctly longer than the invol.-ls. Heads closing after midday towards 2 p.m. Marginal achenes, in their normal state, with spiny scales. *T. pratensis* auct. helv. not L., *T. Schuttleworthii* God.—Meadows; everywhere. 5 . . . **orientalis** L. 1306.
- Fls light yellow, shorter, rarely as long as the invol.-ls. Heads smaller, closing about 11 a.m. 3
- 3. Fls scarcely half as long as the invol.-ls; the latter edged with rose. Peduncles as in the last, scarcely thickened at the time of flowering. Stem often taller and more branchy. Ls narrower. Anther-tube entirely blackish-brown (in the last usually only streaked with black). *T. minor* Fr.?, *T. Pomaretii* F. Schultz.—Road-sides, slopes, hills, sometimes in company with the last; S.! and probably also in other places, but neglected. 5 . . . **dúbius** Vill. 1307.
- Fls about as long as the invol.-ls. Peduncles as in the last, but heads larger. Achenes? — Mountain meadows above Vevey with *T. orientalis*! Chur: Brügg. 5 . . . **pratensis** L. 1307a.
- Fls shorter than the invol.-ls. Peduncles already much thickened like a club at the time of flowering. Achenes about 15 mm long, grayish yellow; those of the margin provided with spiny scales; beak compressed-angular, thickened at the top.—Road-sides, hills; G. W. T. 5 **major** Jacq. 1308.

344. *Scorzonéra*. Salsify. XIX, 10.

- 1. Rt-stock with a thick tuft (formed of bristly fibres of the ls of former years). Stem gen. 1-headed, with 1—3 scale-like ls.—Var.: with ls only 1—2 mm (v. *stenophylla* Gaud.).—Rocks; Tess., lower Rhone-valley, Salève, Vuache. 5 **austriaca** Willd. 1309.
- Rt-stock bare above or crowned with lanceolate (not fibrous) scales 2
- 2. Stem bearing 1—3 heads, with 1—3 small ls. Outer invol.-ls oval-lanceolate, acuminate, but the point itself rather obtuse. S. plantaginea and macrorrhiza Gaud.—Marshy or damp fields; very widely scattered; G. T. V. J. Z. A. S. 5 **húmilis** L. 1310.
- Stem bearing 2—several heads, leafy in the lower part. Outer invol.-ls triangular, subacute.—b. *montana* Mut. Ls narrower, linear-lanceolate or linear.—Cultivated as a vegetable; b. Aostathal. 6 † **hispanica** L. 1311

345. Podospermum. Podosperm. XIX, 10.

1. Stem leafy. Ls pinnatifid, with distant, linear lobes, rarely undiv.—Road-sides; W. 6 *laciniatum* Dec. 1312.

346. Hypochæris. Cat's-ear. XIX, 7.

1. Some of the outer rays of the pappus not plumose, only rough. Stem leafless, gen. with several heads, glabr.—Wood-clearings, grassy places; distrib. 7
radicata L. 1313.
- Pappus hairs all plumose. Stem gen. hispid, with 1 or several ls towards the base 2
2. Stem bearing 1—3 heads; peduncles slightly thickened below the heads. Heads large. Ls bright green, often spotted with violet.—Pasturages of the subalp.; rare; W. V. B. J. 6 *maculata* L. 1314.
- Stem 1-headed, rarely with 2 heads, much and insensibly thickened towards the top. Heads very large. Ls pale green (yellowish).—Alp. 7 *uniflora* Vill. 1315.

347. Willemetia. Willemetia. XIX, 19.

1. Most of the ls rad., oblong-obovate, sinuate-dentate or almost runcinate. Stem bearing 1—several heads, rough above, like the invols, with long black hairs. W. stipitata C. H. Schultz, W. apargioides Cass.—Alp.; eastern Switz. 7 *hieracioides* Monn. 1316.

348. Taráxacum. Dandelion. XIX, 18.

1. Beak shorter than, or at most as long as, the achene. Pappus reddish. T. Pacheri Schultz bip.?—Alp.; Zermatt! St. Bernard! and probably in other parts also. 7
nigricans Rehb. 1317.
- Beak slenderer than in the last, about twice as long as the achene. Pappus white 2
2. Outer invol.-ls applied, oval-acuminate. Ls erect or erect-spreading, faintly toothed or almost entire.—b. *depressum* Grml. (udum Jord., Scorzonera Rehb.?) Pl. more robust with several stems; ls almost as in 1319, spreading on the soil. T. palustre Dec.—Marshy fields; probably distrib.; b. Constance, Vaud, between the type and 1319, perhaps hybrid? 4, 5 *paludosum* Schlecht. 1318.
- Outer invol.-ls reflexed or, at any rate, spreading 3
3. Outer invol.-ls linear or linear-lanceolate, reflexed, the inner gen. not callous at the top. Ls gen. runcinate-pinnatifid, more rarely laciniate, or only sinuate.—Meadows, pasturages, road-sides; everywhere; 4—10
officinale Web. 1319.

- Outer invol.-ls lanceolate or oval-lanceolate, spreading or loosely erect, the inner ones gen. with a callosity or little horn below the tip. Ls gen. more finely div. than in the last. Heads smaller; fls paler. Achenes of an olive-gray or (more often) brownish red (*T. erythrospermum* auct. not Andrz.).—Dry pasturages; not everywhere. 4, rarely in autumn . . . **lævigatum** Dec. 1320.

349. *Chondrilla*. *Chondrilla*. XIX, 19.

1. Heads small, in a very loose spike-shaped raceme. Rad. ls runcinate, withered at the time of flowering, the upper linear-lanceolate or linear. Stem 4—10 *dm*.—b. *rigens* *Rchb.* Upper ls oblong-lanceolate, with spiny bristles at the edges and underneath on the middle nerve.—Dry hills, sandy places in the warmer parts of Switz.; (wanting in G. U. A.). b. W. 6 . . . **júncea** L. 1321.
- Heads of moderate size, arranged in a corymb. Ls glabr., mostly rad., obovate-lanceolate, toothed with distant teeth, the caul. linear. Stem 2—3 *dm*, Gravel of alpine torrents; Graub., St. Gall. (Rhine, Plessur, Landquart). 7
prenanthoides Vill. 1322.

350. *Prenanthes*. *Prenanthes*. XIX, 15.

1. Ls glabr., glaucous underneath; the caul. oblong-lanceolate, with cordate-clasping base. Fls purple.—b. *tennifolia* L. Ls narrow, almost linear.—Woods; distrib. b. Tess., Graub. 7 . . . **purpúrea** L. 1323.

351. *Lactúca*. *Lettuce*. XIX, 20.

1. Fls blue. Perenn. pl.—Stony slopes; scattered (wanting in U. L. A.). 5. 6 . . . **perennis** L. 1324.
- Fls yellow, sometimes tinged with pale violet underneath. Ann. or bienn. pls . . . 2
2. Most of the caul. ls linear, entire, with sagittate base and pointed auricles, spreading. Heads almost sessile, in spike-shaped racemes on long branches.—Stubble-fields; western Switz. as far as Aargau. 7
saligna L. 1325.
- Caul. ls never linear, entire, oblong or oblong-obovate or runcinate-pinnatifid. Heads peduncled, gen. in a pyramidal panicle . . . 3
3. Achenes blackish, rather broadly edged (winged), glabr. Ls horizontal (with the faces turned upwards and downwards), gen. entire. Stem 1—2 *m*. L. *flavida* Jord. Reut.—Stony places, rubbish-heaps; rare; W. V. J. Z. 9
virosa L. 1326.
- Achenes brownish gray, very narrowly edged, rough with short bristles at the top . . . 4

auricles gen. rounded and pressed against the stem. Achenes almost smooth between the ribs.—As the last. 6
asper All. 1334.

3. Caul. ls cordate at the base, with rounded, applied auricles. Peduncles and invols covered with yellow glandiferous hairs. Fls golden yellow.—Fields and field-sides; distrib. 7 **arvensis L. 1335.**

- Caul. ls sagittate at the base, with long, acuminate, spreading auricles. Peduncles and invols covered with black, glandiferous hairs. Fls of a pale yellow.—Marshes, river-side thickets; reported from Wall. but perhaps confused with a larger form of the last species (v. major Neilr.). 7 ***palustris L. 1336.**

355. *Barkhausia*. *Barkhausia*. XIX, 20.

1. Styles yellow. Pl. with a disagreeable smell.—Dry, stony places, fallow; not everywhere (wanting in G. U. L. A. also in eastern and central Switz.). 6, 7 **foetida Dec. 1337.**
— Styles brownish **2**
2. Invol. as also the tops of the peduncles, covered with stiff, yellowish hairs.—Fields, artificial meadows; here and there, but uncertain (wanting in U.). 6
setosa Hall. f. 1338.
- Invol. shortly pubescent-glandular and more or less covered with stellate hairs. Differing from *Crepis biennis* (which resembles it) in the gray invols, the outer ligules being red underneath, with glabr. teeth, and the styles livid-brown.—Hills, fields, road-sides; gen. not uncommon (but wanting in G. T.). 5 . . . **taraxacifolia Dec. 1339.**

356. *Crepis*. *Hawk's-beard*. XIX, 24.

1. Ann. or bienn. pls, with pale fusiform-branching rt. (Stem leafy, terminated by a corymb of several or many heads) **2**
- Perenn. pls, with brown or blackish rt-stock (with the exception of 1345, 1349 and 1350, gen. belonging to the mount. and Alp.) **5**
2. Caul. ls with toothed (rarely almost hastate) auricle-like base. Heads fairly large (30—45 mm in diam.). Outer invol.-ls lanceolate, spreading, the inner with applied hairs on the inner side. Styles yellow.—Fields, everywhere. 5, 6 **biennis L. 1340.**
- Caul. ls with sagittate base **3**
3. Outer invol.-ls linear, applied, the inner glabr. on the inner side. Heads rather small (15—20 mm). Achenes yellowish brown, equally contracted-obtuse at both ends, scarcely narrowed at the top. Pasturages, road-sides,

- fields after harvest (smaller branchy-spreading form: *v. diffusa*). 6 **virens Vill.** 1341.
- Outer invol.-ls slightly spreading. Styles brown. Achenes narrowed to the top **4**
4. Caul. ls rolled under at the edges. Outer invol.-ls linear, the inner with an applied pubescence on the inner side. Achenes chestnut-brown. Pl. pubescent or almost glabr. Heads rather small.—Fields, road-sides; rare; Engadine, Simplon, Nicolaithal, Schaffh. 6
tectorum L. 1342.
- Caul. ls flat. Outer invol.-ls lanceolate, the inner glabr. on the inside. Achenes yellowish brown. Pl. rough. Heads rather larger than in the last but smaller than in 1340. —Meadows, introduced with foreign grass-seeds; V. (not uncommon), Bern &c. 5, earlier than *C. biennis*
nicæensis Balb. 1343.
- 5 (1). Stem leafless or rarely with 1 leaf at the base **6**
- Stem leafy (but sometimes with only 2—1 ls), by exception sometimes leafless **9**
6. Fls orange-yellow. Stem 1-headed, covered above, like the invol., with long black hairs. Ls glabr. Habit of a *Leontodon*, but pappus composed of simple, not plumose, hairs.—Alp., subalp. and Jura. 7 . . . **aurea Cass.** 1344.
- Fls yellow **7**
7. Stem bearing several or many heads; heads small. (Ls oblong-obovate, entire or slightly denticulate) . . . **8**
- Stem 1-headed, or with 1 or few 1-headed branches; heads larger **9**
8. Heads numerous, in a raceme, the lower branches of the raceme bearing 2—3 heads.—Pasturages, wood-edges; not common (wanting in T. W. V. U.). 5, 6
præmorsa Tausch. 1345.
- Heads 3—7, in a corymb. *C. incarnata lutea* Koch.—As the last. T. 5 . . . **Froelichiana Dec.** 1346.
9. Rt-stock cylindric-fusiform, vertical or oblique . . . **10**
- Rt-stock truncate, oblique or horizontal . . . **12**
10. Ls pubescent-glandular, the caul. with sagittate base. Achenes with 20 ribs. Stem bearing 2—5 (1—10) heads; heads very large.—Alp. 7 . . . **grandiflora Tausch.** 1347.
- Ls without glands, the caul. narrowed to the base, or half-clasping with rounded auricles. Achenes with 5 or 10 ribs. Stem 1-headed, or (more rarely) div. into 2—3 1-headed branches **11**
11. Heads very large (45 mm in diam.). Peduncles thickened below the fls (as in *Hypochæris*). Ls irreg. denticulate. *Soyeria montana* Monn.—Alp. and Jura (Dôle, Chasse-ron). 7 **montana Tausch.** 1348.

- Heads distinctly smaller; peduncles slender, not or little thickened. Ls sinuate-dentate or runcinate.—Alp. and subalp., also lower; eastern Switz., Irchel, Schaffh., Tess. 7 **alpestris Tausch. 1349.**
- 12 9). Stem 30—90 *cm*, bearing 1—many heads. **13**
- Stem 2—10 *cm*, 1-headed, or div. into several 1-headed branches. **15**
- 13. Pappus (as in *Hieracium*) of a dirty white, rather stiff, brittle. Achenes with 10 ribs. Peduncles and invols with abundant black, glandiferous hairs. Stem bearing several heads, glabr. like the ls. Caul. ls with cordate or sagittate base.—Ditches, meadows and damp woods; distrib. 5 **paludosa Mönch. 1350.**
- Pappus pure white, flexible. Achenes with 20 ribs **14**
- 14. Stem bearing several or many heads; heads of medium size. Fls golden-yellow. Ls entire or indistinctly toothed, the caul. not numerous, with rounded or faintly cordate base, the lower ones often contracted above the base. —Var.: Stem and ls hairy (*v. mollis*) or glabr. (*v. glabra*). —Jura (from Reculet to Passwang); rare in the Alp. (A). 6 **succisifolia Tausch. 1351.**
- Stem bearing 1—5 heads; heads large. Fls light yellow. Ls sinuate-dentate, the caul. more numerous than in the last, the lower ones gen. already withered at the time of flowering, the others with cordate or sagittate base.—Alp., subalp. and Jura. 6 . **blattarioides Vill. 1352.**
- 15 (12). Ls all petioled, oval or cordate-oval, with lyrate-dentate petiole, often reddish underneath. Stem 5—15 *cm*, prostrate, bearing 1 or few heads, the invol. and tops of peduncles gray-flaky.—High Alp.; G. W. V. 7 **pygmæa L. 1353.**
- Caul. ls sessile or slightly petioled, but never oval **16**
- 16. Ls entire or slightly toothed. Stem only 3—5 *cm*, 1-headed, with 1—2 ls. Invol. very villous. Fls golden-yellow.—Alp., very rare; G. W. (Sampuoir, Fimberpass, Flimserstein, Zermatt, Bagnethal). 7 **jubata Koch. 1354.**
- Caul. ls pinnatifid **17**
- 17. Stem 3—5 *cm*, 1-headed, thickened at the top. Ls lyrate- or runcinate-pinnatifid, the numerous caul. ls diminishing little in size towards the top, almost enveloping the large head.—High Alp., principally in eastern Switz. 7 **hyoseridifolia Tausch. 1355.**
- Stem 7—15 *cm*, 1-headed, or div. into a few 1-headed branches, with 2—3 ls, having almost the same thickness above as below. Caul. ls pinnatifid or -partite, with lobes almost linear, often curved. *C. chondrilloides* and *rhætica* Fröl.—Alp.; G. 7 . **Jacquini Tausch. 1356.**

OBS. Hybrids: *C. alpestris-blattarioides*; *C. alpestris-grandiflora* (*C. longifolia* Heer); *C. blattarioides-grandiflora*; *C. hyoseridifolia-Jacquini* (*C. hybrida* Kern.).

357. *Chlorocrepis*. *Chlorocrepis*. XIX, 24.

1. Stem leafless, scaly towards the top, bearing 1—3 heads. Ls glaucous, glabr., linear-lanceolate, entire or with distant teeth. Fls light yellow, turning green when dried. Rt-stock long, slender. *Hieracium staticifolium* All.—Rocky places in the Alp. and subalp., descending to the plains with rivers. 7 . . . *staticifolia* Griseb. 1357.

358. *Hieracium*. Hawk weed. XIX, 23. *)

1. Achenes $1\frac{1}{2}$ —2 mm long, denticulate at the top by the prominent ends of the ribs. Rt-stock often stoloniferous. (Ls gen. entire, narrowed towards the base, with no distinct petiole.)—Subgenus I. *Pilosella* 2
 — Achenes $2\frac{1}{2}$ —5 mm long, not clearly denticulate at the top. (Fls always yellow.)—Subgenus II. *Euhieracium*. 21

Subgenus I. *Pilosella*.

2. Stem leafless or bearing a single l., 1-headed (peduncle mostly rad.), or 1—3 times forked, the heads with, more or less, long peduncles. Ls always having stellate hairs underneath! rt-stock gen. stoloniferous. Ligules of the circumference gen. reddish underneath. —Sect. I. *Pilosellina* 8
 — Stem bearing, in the lower portion, 1—3 ls, rarely more; 3—100 heads, arranged at the top of the stem in a corymb, the heads being more shortly peduncled than in the pls of the last paragraph; exceptionally the stem is dichotomous, or by suppression bears only 1 head, but then the ls have no stellate hairs underneath (*Auricula*), or the stolons wanting and the marginal ligules concoloured, yellow (*glacialis*, *alpicola*) 3
 3. Ligules purplish or orange, or yellow but those of the circumference purplish underneath. High mountain pls 15
 — Ligules all concoloured, yellow 4
 4. Heads 3—5, rarely more, or solitary through suppression. Stem gen. arched at the base. 5—20 cm high 5
 — Heads 7—100, rarely fewer. Stem gen. upright from the base, 30 cm high or more 6
 5. Ls glandless (comp. *H. Lageri*). Stem terminated by a corymb (sometimes umbelliform) 12
 — Ls glandular. Stem 1—several times forked towards the top. (Species of the high Alp. of Wall., absolutely without stolons) 14

*) Compare: **Burnat et Gremli**, catalogue des *Hieracium* des Alpes maritimes. 1883, and **Gremli**, les *Epervières* du Valais in B. S. M. XII, also N. Beitr. III, 47; also, for the subgenus *Pilosella*, the excellent monograph by **Nägeli and Peter** (= N. P.); "*Hieracien* Mittel-Europa's," 1885; and the *Exsiccata* distributed, by Peter.

6. Ls rather firm, glaucous or slightly so, often glabr. above. Rooting, above ground, stolons almost always 0.*) Hairs more or less stiff, bristle-like, gen. long . . . **19**
- Ls green or yellowish-green, almost always hairy on both sides, the upper often having some glandiferous hairs at the edges **7**
7. Rt-stock almost always stoloniferous; the stolons sometimes subterranean, brittle, with small pale (scaly) ls; sometimes above ground, firmer, with green ls more developed, and terminated by a rooting rosette. Ls, at least above, without stellate hairs. Upper branches of the inflorescence crowded (infloresc. sub-umbellate) **17**
- Rt-stock without stolons, rarely with subterranean scaly stolons. Ls gen. with stellate hairs on both sides (at any rate underneath). Branches of the inflorescence all close together; infloresc. umbellate (lax or compact) **18**

Section I. *Pilosellina*. (2).

8. Stem ascending at the base, 1 or several times forked, with 2—4 heads, provided, like the broad invols, almost throughout the whole length with numerous long, dark-coloured hairs. Ls with stellate hairs underneath which are sometimes few, sometimes numerous. Invol.-ls acute. Ligules of the circumference concoloured, rarely (v. vittatiflorum) reddish underneath. Intermediate species between *H. glaciale* and *Hoppeanum*. *H. acutifolium* Vill.? *H. sphærocephalum* Fröl. (1838). *H. hybridum* Gaud. p.**) High Alp. 13—2600 m), only in the eastern Alp. (to the east of the St. Gothard). 7 *furcatum* Hopp. (1831). 1358.
- Stem 1-headed (comp. *H. Pilosella*). Ls more or less white or gray-tomentose underneath. Type of *H. Pilosella* **9**

*) There is no occasion to confuse the runners with the stolons; see *H. florentinum* and *Bauhini*.

) There is no occasion to confuse *H. furcatum* with other intermediate forms, perhaps not hybrids, between *H. Hoppeanum* and the *Auriculina*, as *H. latisquamum*, *exrylepium*, *brachycomum* and *permutatum***, all inhabiting only the eastern Alp.—Here may also be sought the forms derived from *H. Pilosella*, especially ***H. auriculiforme* and *brachiatum***, not to be confused with certain forms of *H. Pilosella* which have dichotomous stems.—The forms derived from *H. aurantiacum* with dichotomous stems, *i. e.* the intermediate forms between *H. aurantiacum* and the *Pilosellina* differ from the last in the, more or less, red fls and the general presence of stolons characteristic of *H. aurantiacum*. See thereon the observation I at the end of the genus.—All the forms of the subgenus *Pilosella* with dichotomous stems are intermediate forms ("Zwischenformen"), sometimes hybrids sometimes not, except ***H. alpicola***, a high alpine species of Wallis, which is well separated from the others, and easily distinguished by its invols being very woolly-villous, like the *Barbata*, its ligules all of one colour, yellow, its ls glandular and its rt-stock absolutely without stolons.

9. Invol.-ls oval, broad (3—4 *mm*), more or less obtuse, blackish with a whitish or greenish border, gen. clearly imbricated. Pl. more robust than *H. Pilosella*, with short, thick stolons bearing crowded, large ls. *H. pilosellæforme* Hoppe (1814).—Eastern Alp. 7

Hoppeanum Schult. (1814) 1359.

- Invol.-ls acute or acuminate, not imbricated **10**
10. Stolons short, thick, with close-set ls almost all of the same length. Invol.-ls about 3 *mm* broad at the base, distinctly acuminate. Ls gen. longer than in *H. Pilosella*, with more numerous and longer bristle-like hairs on the upper face. Invol. with long, fine, very numerous hairs, without glands.—Alpine valleys; Graub. (Avers), Wall.; 500—2500 *m*. 5 **Peleterianum Mèr. 1360.**
- Stolons, more or less, long and slender, leafy, ls gen. decreasing in size towards the end of the stolon. Invol.-ls about 1—2 *mm* broad, acute (neither acuminate nor obtuse) **11**
11. Invol. gen. glandular, more or less tomentose (with stellate hairs), and having, at the same time, long, simple hairs. Species very variable; var.: stem forked (*v. caulescens*); ls hardly tomentose, almost greenish underneath (*v. virescens*); invol. dark-coloured, very villous (*v. melanops*); or covered with very numerous, glandiferous, black hairs (*v. nigrescens*).—*b. velutinum* Heg. (*incanum* Dec.) Ls more or less tomentose above.—Hills, roadsides; distrib., ascending to 2600 *m*; *b.* especially in the Alps. 5 **Pilosella L. 1361. *)**
- Invol. almost always without glands, very tomentose, with very fine, short (silken!) hairs. Rad. rosette small; stem slender; head small; flowering 4—5 weeks later. *H. Pilosella niveum* Müll. arg.—*b. amphipolium* N. P. Analogous variety of *H. Pilosella velutinum*.—Wall., up to 2000 *m*. (Eginenthal, Simplon, vallée de la Viège, Sion, Martigny), Noirmont (Jura); *b.* Sion. 6
- tardans N. P. 1362.**

Section II. *Auriculina*. (5.)

12. Ls rather glaucous, more or less spathulate (dilated towards the upper portion, almost obtuse at the top), glabr. or with scattered, bristle-like hairs, absolutely without stellate hairs. Invol.-ls obtuse, dark-coloured with a pale margin, more rarely (*v. melaneilema*) dark all over. Rt-stock producing longer or shorter, above-ground stolons.—Dry fields and damp pasturages, up to 2500 *m*; distrib. 5 **Auricula Lam. 1363.**

*) Näg. and Peter mention 46 varieties in Switzerland.

- Ls green or scarcely glaucous, always, at least underneath on the mid-nerve or at the edges, with stellate hairs. Invol.-ls acute or rather obtuse, entirely dark-coloured. Alpine pls (hardly below 1700 m) wanting in the Jura **13.**
13. Stem 3—15 cm, bearing 2—5 heads, leafless or only with 1, often reduced, leaf in the lower part. Stolons 0 or short, rarely rather long. Ls often narrower and more acute than in the last, with stellate hairs which are found particularly at the edges and on the mid-nerve, sometimes very numerous on both sides. Inflorescence contracted or lax. Invol. always covered with long, fine, more or less numerous hairs. *H. angustifolium* Sprgl. (1826). *H. breviscapum* Koch. p.—Alps (1750—2600 m). 7 **glaciale Reyn. (1787) 1364.*)**
- Stem 20—30 cm, bearing 3—10 heads, with 1 fairly developed leaf about the middle. Stolons always 0. Ls green. Intermediate between *H. glaciale* and *H. cymosum sabinum* (see 18), but not hybrid. *H. densicapillum* N. P., *H. glaciale* Lageri Christen., *H. echioides* Heg.?—Alps (1800—2600 m), gen. with the last; G. W. 7 **Lageri Schultz. bip. 1364.a**

Section 3. *Alpicolina*. (5.)

14. Ls covered above with bristle-like, very long and numerous, hairs, which are rare or wanting on the underside. Invol. almost globular, covered with very long, fine and numerous hairs, also invol. cottony-villous as in the *Barbata*, *H. piliferum* and *H. glanduliferum*, but differing from these last distinctly in the ls being covered underneath with numerous stellate hairs. *H. furcatum* Koch p.—High Alps (2000—2600 m), very rare; Wall. (Simplon! Saasthal! Zermatt, Louèche?), Mt. Legnone (Veltlin). 7 **alpicola Schleich. 1365.**

Section 4. *Collinia*. (3, 7.)

14. Stem erect, 30—70 cm, bearing 8—30 heads arranged in a more or less umbel-shaped, dense or lax corymb. Ls gen. with stellate hairs above (see var. b.). Stolons 0 or under-ground and scaly. Species allied to *H. cymosum sabinum* by its habit, long hairs &c. but easily distinguished by the colour of its fls. *H. multiflorum* Schleich! *H. cymosum rubellum* auct., *H. cymosum aurantiacum* Gaud.—b. *Guthnickianum* Heg. Variety allied to *H. aurantiacum* by its habit and its inflorescence not being umbel-shaped and laxer; ls without stellate hairs

*) *H. niphobium* N. P. is composed of intermediate forms, some hybrids, some not, between *H. glaciale* and *H. Auricula*.

above.—Alps (1450—2300 *m*); Graub., Wall., Vaud (Alp de Montreux) and probably in other places, but confused with *H. cymosum sabinum*; b. Graub. 7

cruentum Näg. Pet. 1365a.

- Stem gen. ascending, bearing 3—10 (rarely more) heads arranged in a, more or less, lax corymb. Ls without stellate hairs above and only few below. Stolons sometimes under-ground, brittle, bearing pale, scaly ls; sometimes above-ground, firmer, with ls more developed 16

16. Ls soft, green, rarely rather bluish, oblong-lanceolate. Stem 20—45 *cm*, hollow and easily compressed. Invol. medium sized or fairly large, broad, with more or less obtuse ls. Hairs (at least in the most distributed forms) soft, very numerous and very long, often blackish at the base. Ligules dark purple, or pale-purple*) (see var. d.). *H. Hinterhuberi* Schultz bip.—b. *spanochaetium* Näg. Pet. Form approaching *H. Auricula* by its bluish, spathulate, less-hairy ls.—c. *pseudoaurantiacum* Näg. Pet. Approaching *H. cymosum sabinum* in habit, and invol. covered with numerous stellate hairs; also resembling *H. cruentum*.—d. *auropurpureum* Näg. Pet. Approaching *H. furcatum* in its lax inflorescence; hairs very long; resembling *H. fulgens* (aurant.-fuscum).—e. *decolorans* Fr. (aurant. luteum Koch). Ligules orange yellow, those of the circumference streaked with red underneath.—Alp. (1450—2100 *m*); reported also from the Jura (Mt. Tendre and Chasseron); b. Graub. (Splügen, Engadine); c. Graub. (Avers), Wall. (Eginenthal, Sion, St. Bernard); d. Graub. (Avers); e. Graub. (Parpan, Engadine). 7 *aurantiacum* L. 1366.

- Ls more or less bluish-green and often spathulate (as in *H. Auricula*). Stem 12—30 *cm*, solid. Invol. variable. Hairs sometimes rare, sometimes numerous and long. Ligules dark or pale purple, or orange-yellow, those of the circumference red underneath. Rt-stock with stolons partly under-ground, short, scaly; partly above-ground, more or less elongated. *H. aurantiacum bicolor* Gaud. —A collective species of the intermediate forms between *H. aurantiacum* and *H. Auricula* (b. *chrysanthes* N. P.), and between *H. aurant.* and *H. niphobium* (c. *fuscum Villarsii*), also having the habit of *H. niphobium*, with yellow ligules, but those of the circumference red underneath (d. *chrysoniphobium* N. P.), or, lastly, very near to *H. aurantiacum*, but the heads smaller and slighter, and

*) There are no forms with entirely yellow fls in this species, Näg. and Pet. refer, with hesitation, the var. **flavum** Gaud. to a form of *H. aurantiacum* with broader invol.-ls and pale purplish fls. See also the var. e.

the ligules yellow, except those of the circumference which are red underneath (*E. permixtum* N. P. = *H. aurantiac. microcephalum* Lagg.)—Alps (1700—2580 m), especially in Graub. (Engadine, Albula, Splügen, Avers, Parpan), more rare in Wall. (Eginenthal, Simplon), Vaud (Alp de Montreux), Glarus (Sandalp), Appenzell. 7

fuscum Vill. 1367. *)

- 17 (7). Stem hollow, easily compressed, often reddish in the lower part. Ls green, larger and broader than in *H. florentinum*, often slightly sinuate-denticulate. Hairs long. Invol. dark, with numerous simple and a few glandiferous hairs. *H. fallax strigosum* Gaud. herb.! *H. pratense* Tausch (1828).—Meadows and peat-bogs; only in the lower part of the St. Gall Rhine-valley; also not far beyond our boundaries near Bregenz, Lindau and Constance, found also in the north-east of Switz. (See B. S. M. 19.) 7 *collinum* Gochn. (1808) 1368.

Section 5. *Cymosina*. (7.)

18. Stem 40—70 cm. Ls gen. broader and more obtuse than in *H. florentinum* and *H. Zizianum*, green or slightly yellowish-green. Inflorescence more or less umbel-shaped! Invol. small, slight. *H. Nestleri* Koch.—a. *typicum*. Inflorescence lax; peduncles and invol. with long whitish, gen. very numerous hairs, mixed with glandiferous hairs which are not numerous, or, at any rate, not easily seen; stem-hairs short.—b. *sabinum* Seb. and Maur. Like var. a., but inflorescence more or less compact! hairs longer (those of the lower part of the stem longer than its diam.).—c. *cymigerum* Rchb. (*cymosum* Vaillantii Excursfl., *H. fallax* Schl.!) Inflorescence very lax; invol. and peduncles less villous than in the 2 last, but more glandular; hairs always very short.—d. *Sandozei* Grml. N. Beitr. III, 13. Approaching *H. florentinum piloselloides* (hybrid?) by its inflorescence.—Hills; a. lower and mountain region, rare; Wall.! Bruggerberg! Irchel! Schaffh.! Altstätten; b. Alp. especially southern (14 to 2000 m); Graub., Wall. and probably other parts, confused with *H. cruentum*; c. Grindelwald! Wall.? d. Fully. 5 (at least var. a. before *H. florentinum* and *H. Zizianum*)

cymosum L. 1369.

- Comp. *H. Laggeri* (13) differing from *H. cymosum sabinum* in its lower stems, its shorter rad. ls and its heads being rather larger. See also *H. Zizianum* (20) and *cruentum* (15).

*) The forms derived from *H. aurantiacum* may also be sought for here.

Section 6. *Præaltina*. (6.)

19. Rt-stock with above-ground stolons, prostrate and leafy, terminated by a rooting rosette! (as in *H. Auricula*); in other respects like *H. florentinum*. *H. magyari-cum* N. P., *H. stonolosum* Heg., *H. præaltum stonolosum* Excursfl.—Hills, very rare; once (30 years ago) near Schaffh., between the town and the falls of the Rhine, on the Zürich-side!! Altstätten, St. Gall. (Zollik.). 6

Bauhini Schult. (1809) 1370. *)

- Rt-stock always without above-ground, rooting stolons, but sometimes producing in the axils of the rosette-ls rad., ascending, and flower-bearing branches, like lateral stems 20

20. Inflorescence panicled (*i. e.* with all the branches separated). Stem solid or slightly hollow. Ls (lanceolate, acute) almost always without stellate hairs above and gen. very few underneath; upper ls without glands. A very variable species.—A. Branches of the inflorescence arched-ascending after flowering; peduncles slender without long non-glandiferous or stellate hairs, or the latter not numerous, but always with glandiferous hairs; heads very small (the smallest of the genus); ls always without stellate hairs: a. *piloselloides* Vill.—B. Branches straight or almost so after flowering; peduncles gen. stronger, with or without long non-glandiferous hairs, but always with numerous stellate hairs and with or without glandiferous hairs; heads larger (*H. præaltum* Excursfl.). —I. Invol with more or less numerous blackish, glanduliferous hairs, but with few or no long hairs: b. *obscurum* Rchb. (here as an alpine variety slender, reduced, with black invol; v. *Berninæ* Grisb.). —II. Invol with gland. hairs more or less pale, less numerous and less visible. —1. Ls with numerous stellate hairs, but with short (bristly) simple hairs: c. *mite* Gaud.!—2. Ls with long, more or less numerous, bristly hairs, with no, or few, stellate hairs: d. *hirsutum* Grml. (*fallax* Dec. not Willd.**). —3. Ls with no bristly hairs or only at the edges and on the middle nerve of the under side; invol with few or no long hairs: e. *præaltum* Vill.—4. As the last, but invol with numerous long hairs; inflorescence very lax,

*) Our form resembles an *H. præaltum* (*florentinum*) *stoloniferum*. The typical form which resembles an *H. piloselloides stolonifere*, is found chiefly in Austria and Hungary. *H. Auricula* Schleich. herb.! ought to be mentioned here (without indication of locality), and *H. præaltum auriculoides* Griseb.—**H. auriculoides** Lang (*præaltum setosum* Koch p., *H. hispidissimum* Fr.) = *H. pannonicum* N. P. = *H. Bauhini-echioides*.

*) **H. fallax** Willd. = *H. cymosum-echioides*.—**H. præaltum hirsutum** Koch, at least in part, = *H. calodon* Tausch. = *H. echioides-florentinum*.

lower branches springing lower; ls thick: *f. fastigiosum* Grml.—Hills, dry and rocky places, distrib.; a. the most normal forms in the gravel-beds of alpine torrents, especially of the southern Alp., descending to the valleys; c. in Wall., as also the var. b. d. e. and f., the 4 last found by me (Gremli) near Haslach (Schaffh.) where they are all mixed together and in company with *H. Zizianum*. 6 **florentinum All. 1371.**

- Inflorescence more or less umbel-shaped (branches more or less closely set). Stem hollow, easily compressed. Ls with more or less numerous bristly hairs, also with stellate hairs on both sides; upper caul. ls often with a few glandiferous hairs at the edges. Rad. ls often partly withered at the time of flowering; ligules often rolled up. Species approaching *H. cymosum*, from which it differs both in its glaucous ls and its longer bristly hairs. *H. echioides* Gaud. not Lumm., *H. collinum* Heg. not Gochn —Hills, rare; G. (Samaden), W. (St. Leonard, Vétroz, Lourtier), S. (Haslach). 6 **Zizianum Tausch. 1372.**

Subgenus II. *Euhieracium*.

- 21 (1). Hairs of the ls, more or less, plumose, *i. e.* furnished with small teeth, the length of which is several times as great as the breadth of the hair. Glandiferous hairs at the edge of the leaf 0. Invol. cottony-villous **64**
- Hairs of the ls all, or at least partly, glandiferous (which may be seen at the edge of the upper ls! Peduncles glandular) **22**
- Hairs of the ls, when present, neither plumose (their teeth, at most, equal in length to the breadth of the hair), nor glandiferous **27**
- 22. Pls phyllopodous*) **23**
- Pls aphyllopodous*) **26**
- 23. Ligules with glabr. teeth. (Stems leafy. Alveoles of the receptacle glabr. or almost so) **24**
- Ligules with distinctly ciliate teeth **25**
- 24. Hairs of the ls all glandiferous. *Intybacea* **59**
- Hairs of the ls partly not glandiferous. *Rupicola* **63**
- 25. Alveoles of the receptacle strongly fringed-ciliate. Stem bearing 2—several ls (and with a, gen. woolly, neck). *Amplexicaulia* **60**
- Alveoles of the recept. glabr. or almost so. (Caul. ls, when present, narrowed towards the base.) Alpine pls **48**

*) The pls of this genus are called **phyllopodous**, when their rad. ls are still fresh at flowering time. **Aphyllopodous** when their rad. ls are destroyed or withered at flowering time. Those species of which the rad. ls are sometimes still fresh, but not numerous, sometimes dried up, are called **hypophyllopodous**.

- 26 (22). Ligules glabr. Ls not clasping, with hairs all glandiferous! *Intybacea* 59
- Ligules with teeth distinctly ciliate (rarely—in hybrid forms? almost glabr.). Ls more or less clasping. *Picroidea* 57
- 27 (21). Pls phyllopodous, more rarely hypophyllopodous (see the note to 22) 28
- Pls aphyllopodous. (Stem with more or less numerous ls. Late-flowering species) 31
28. Invol.-ls numerous, in several rows, imbricated (sometimes less distinctly imbricated but then the outer ls long). Ls gen. glaucous, the rad. more or less narrowed towards the base, gen. without a distinctly separate petiole*) 29
- Invol.-ls not imbricate, the inner ones gen. of equal length, the outer gen. very short 30
29. Ligules with ciliate teeth (sometimes indeed only feebly ciliate). Alveoles of the recept. fringed-ciliate. Peduncles glandular 46
- Ligules glabr. (by exception, only ciliate, but then the peduncles without glands). Alveoles of the recept. glabr. or almost so 32
30. Caul. ls, when present, petioled or sessile with a narrowed base. Ligules glabr., rarely ciliate 66
- Caul. ls always present, and more or less clasping. Ligules gen. ciliate. *Subprenanthoidea* 51
- 31 (27). Ligules gen. ciliate. (Ls clasping, the lower and middle ones often rather fiddle-shaped) 52
- Ligules absolutely glabr. (Invol.-ls more or less distinctly imbricate. Peduncles gen. not glandular) 75
- 32 (29). Invol.-ls obtuse. Ls narrow, rather firm, often fairly glabr. (always so above). Peduncles scaly in the upper part. *Glaucia* 34
- Invol.-ls acute or acuminate 33
33. Stem, when 1-headed also, gen. with 2—several ls. Peduncles without glands (only by exception glandular). Hairs of the invol. long, white. *Villosa* 37
- Stem gen. not tall, 1-headed and leafless; more rarely taller, with 2—3 heads, and 1—3 caul. ls (always narrowed at the base). Peduncles glandular (comp. *H. piliferum*). Invol. *villous-bearded* with long, very numerous, hairs which are spreading or almost pendant, whitish-gray, often of a dirty colour. *Barbata* 44

*) Among the species included here *H. dentatum* and *H. Gaudini* in particular recall the *Pulmonarea*; some species without glands of the following section, such as *H. Trachselianum*, *Mureti* and *cæsius* recall the *Aurelia*.—*H. gombense* may be sought here.

Section 1. *Glaucæ*.

- 34 (32). Invol. ls (broad, appressed) with long, not glandiferous, fairly numerous, hairs and at the same time with very dense stellate hairs especially near the edges, which gives the invol. a whitish-gray, glandless appearance. Stem branchy with spreading branches, bearing 1 or few ls. Rad. ls oblong-lanceolate or lanceolate, more or less deeply sinuate-dentate, with, often fairly abundant, hairs at the edges and underneath; hairs distinctly denticulate. *H. glaucopsis* Fr. p. not Gren.—Mount. and subalp.; G. W. (Bergün! Sembranchier!) 7 **Delasoëi Lagg.! 1373.**
- Invol.-ls without long simple hairs, or, when these are present, the stellate hairs are rare. Ls without stellate hairs underneath **35**
- Invol.-ls without long simple hairs, but with very abundant stellate hairs. Ls with more or less numerous stellate hairs underneath. Comp. *H. Mureti*. 69.
35. Invol.-ls with scattered simple hairs and glands, but almost without stellate hairs. Stem with spreading branches, scarcely more than 20 cm, not very leafy, slightly arched, bearing few heads. Rad. ls lanceolate, often slightly oblique, acuminate. sinuate-dentate, gen. with scattered hairs. Invol.-ls pale. Differing from *H. Trachselianum* in its very obtuse invol. ls. *H. inclinatum* Arv.-Touv. 1879?, *H. glaucopsis* Chr. p. not Fr., *H. saxatile* Lagg. exs. non Jacq.*), *H. Allionii* Monn.?—Torrent gravel-beds, rare; W. (vallée de Conche!), Freibg. (Bulle!). 7
arenicola God. 1374.
- Invol. without, or with simple, hairs, but in the latter case the stem has upright branches and more or less numerous ls **36**
36. Stem with spreading branches. Caul. ls not numerous, narrow. Invol. ls without simple, but with more or less abundant stellate, hairs, the outer ones appressed. Rad. ls sometimes very narrow, sometimes fairly broad, with entire or (more commonly) sinuate-denticulate edges. *H. glaucum Willdenowii* Grml. —Stony places of the Alp. and subalp. to the foot of the mount.; hitherto only in eastern Switz.: G. (Filisur! Lenzerheide! Engadine!) Uri! Appenzell? 7
glaucum All. 1375.)**

*) *H. saxetanum* Fr. (saxatile Jacq. obs. nec Vill.) has been reported by Arvet-Touvet as near Sembranchier; hitherto we have only seen it in Austria.

**) *H. glaucum intermedium* Grml. N. Beitr. III, 15. Invol. ls as in *H. glaucum*, but with scattered glands; branches almost erect; ls often stronger haired, with stellate hairs underneath: Saasthal!

- Stem with erect branches. Caul. ls more or less numerous (3—10) and gen. broader than in the last. Invol. ls with simple (often rather numerous; comp. the var.), but without stellate, hairs, or the latter only scattered; the outer ls spreading (?). Rad. ls gen. with entire edges. (Not to be confounded with *H. scorzonnerifolium calvum*).
 **H. glaucum bupleuroides* Grml., *H. graminifolium* Gaud. a. and b.!—b. *juratense* Grml. N. Beitr. III, 15. (*graminifolium legitimum* Gaud. from Salève!) Heads larger; invol. ls broad, very distinctly imbricate, without simple hairs, the outer ones appressed.—As the last, but more widely distrib. (in G. also); b. Jura! Salève! Alp. of Bex! 7 *bupleuroides* Gmel. 1376. *)

Section 2. *Villosa*.

- 37 (33). Ls firm as in the *Glaucæ*; when dried and held to the light only showing an indistinct net-work of veins; almost always glabr. above, with edges entire or toothed; the caul. narrowed or enlarged at the base. (Invol. ls fairly equal, i. e. the outer ones not sensibly broader) 38
- Ls soft, showing a more distinct net-work of veins when dry, glabr. or hairy above, often more or less toothed, the caul., when present, gen. narrowed at the base. (Invol. ls fairly equal) 39
- Ls (distinctly glaucous) soft, showing a distinct net-work of veins when dry, gen. hairy on both sides and with entire (rarely toothed) edges; the caul. enlarged at the base, very often almost half-clasping. (Inner invol. ls fine-acuminate.) Type of *H. villosum* 43
38. Ls with entire edges or distantly denticulate, the rad. still fresh at the time of flowering; the caul. (2—4) lanceolate, gen. fairly broad at the base. Invol. ls acute or acuminate. This species has the narrow, somewhat firm ls of *H. glaucum*, the structure and hair qualities of the invol. of *H. elongatum*. Stem stiff, rather flexible, often rather reddish as also the teeth of the ls. *H. glabratum* Koch.**) *H. flexuosum* var. c. and d. Gaud.! —Rarely varied; rather glabr., the invol. only slightly villous (v. *calvum*; a var. which needs not be confused with *H. bupleuroides*, the invol. ls of which are obtuse

*) *H. Tatræ* Grisb. (*bupleuroides glaberrimum* Fr.) has the invol. of *H. juratense*, but is hypophyllopodous, and has 15—20 caul. ls; according to Levier, near Bormio.—*H. porrifolium* L. has very narrow ls (almost like grass), it is found by Lake Como; but not in Switzerland.

**) *H. glabratum* Hopp. Slender, often 1-headed; ls glabr.; invol. ls narrowed to a longer, but rather blunt, point. Hitherto we have only met with it in the Tyrol.

- and more imbricated); further: ls slightly sinuate-dentate, the stem, at the same time, taller (v. *dentiferum* N. Beitr. III. 13).—b. *helveticum* (H. *flexuosum helveticum* Fr.! H. *speciosum* Rap. not Hornem., H. *Rapini* Grml. B. S. M.*) Ls fairly glabr., the rad. often partly withered at the time of flowering, the caul. numerous, long, with almost entire and often almost parallel edges, the base broad, almost half-clasping. Invol. darker, slightly villous, with stellate hairs.—Alp., subalp. and Jura; b. Alps of Zermatt and Gruyère. 6 . **scorzonerifolium Vill. 1377.**
- Ls distinctly toothed, the rad. withered at the time of flowering (especially in cultivated pls); the caul. 5—8 (in the cultivated pl. as many as 15), long-lanceolate, the lower ones narrowed gradually at the base. Invol. ls (villous and covered with stellate hairs) ending in a rather blunt point. A critical species, intermediate between H. *dentatum* and H. *scorzonerif.*—Alp., very rare; Binnthal! Zermatt? Bagnethal! Brülltobel, Ct. Appenzell (Zoll.); not Chasseral. 7, 8 . **speciosum Hornem. 1378.**
- 39 (37). Ls distinctly glaucous, the caul., when present, narrowed at the base **40**
- Ls green or only bluish underneath (gen. hairy on both sides. Invol. ls with few stellate hairs, the inner ones finely acuminate) **42**
40. Invol. ls faintly villous, with isolated pale glands, and pale edges.—Alp., rare; Grindelwald, Oeschinensee, Kandersteg, Rosenlauri, Unterwald. 7
- bernense Christener! 1379.**
- Invol. ls without glands **41**
41. Ls gen. hairy on both sides, toothed, the caul. 0—2 (rarely 3), reduced or only one developed. Pl. gen. weaker than H. *villosum* and H. *dentatum*, less villous than the former. The almost leafless specimens ought not to be confounded with H. *piliferum* which differs in its ls not being petioled, narrower and entire, and in its bearded-villous invol. H. *subnudum* Schl.! Heg. not Fröl., H. *Schraderi dentatum* Gaud.! H. *dentatum pusiolum* Fr.! H. *pilosum* Fröl.—Alp. and subalp.; G. W. V. B. O. U. A. 7 **Gaudini Christen. 1380.**)**
- Ls gen. glabr. above, coarsely toothed, the caul. 2—4, fairly developed (sometimes as large as the rad.), oval-lanceolate. Pl. less hairy than H. *villosum*. Stem often

*) **H. chloræfolium Arv.-Touv.!** (Simplon) which is also almost glabr., resembling that form, but with shorter, broader ls.—**H. callianthum Arv.-Touv.!** differing from H. *scorzonerif.* in its stronger villosity, its broader caul. ls and its rather larger heads; near Lourtier in Wallis.

*) **H. incisum Hoppe Fr. nec Koch,** with large heads becoming blackish, is perhaps an H. *murorum-villosum*. Bernina-Heuthal.

thick and slightly arched; rad. ls often with a distinctly separated petiole, the caul. gen. narrowed at the base. Invol. ls equal (narrow-acuminate), the outer ones often paler, forming an outer invol. Collective species? *H. pallescens* Gaud.! not W. K., *macrophyllum* Schl.! —b. *salævense* Rap.! Caul. ls only 2 (at most 3), broader, hairy above; the rad. numerous; peduncles with black, and sometimes glandiferous, hairs at the base; invol. ls less acuminate, darker. —Alp., rare; Engadine! Tessin! Wallis! Vaud! Freibg. Ganterisch! Appenzell; b. Salève! 7

dentatum Hoppe. 1381. *)

- 42 (39). Ls gen. distinctly toothed; hairs of the rad. ls not denticulate. Peduncles gen. without glands. Stem gen. 1-headed. Caul. ls up to 8 in number, sometimes broad. *H. pilosum* auct. p. Alp. and subalp.; W. V. B. O. A. 7

pseudoporrectum Chr.! 1382.

- Ls with almost entire edges; hairs of the rad. ls distinctly denticulate. Peduncles often with isolated glands. Stem with 2—4 ls, and 2—5 heads with long straight peduncles which bear linear scales in the upper part. Rad. ls with a long and gradual attenuation at the base. Invol. ls more finely acuminate than in the last. Ligules glabr.—Reulet in the Jura. 7 * **porrectum** Fr.! 1383.

- 43 (37). Invol. ls fairly equal, the outer ones only as broad or indeed narrower than the inner, applied or loosely erect. Pl. often with several stems, taller, more leafy, and often rather less glaucous than *H. villosum*; caul. ls several (as many as 8, rarely fewer than 4), broadly rounded at the base, oval or oval-lanceolate, the rad. often partly perished at the time of flowering. Hairs often rather less abundant and shorter than in *H. villosum*, those of the lower ls often more distinctly denticulate. Heads gen. more numerous, closer packed, smaller, with darker invol. Ligules sometimes slightly ciliate.—Var.: ls coarsely sinuate-dentate. (v. *grossidens* Fr.!) *H. obscurum* Zoll.—As in *H. villosum*. 7

elongatum Fröl. 1384.

- Invol. ls unequal, the outer ones distant, spreading, distinctly broader, often almost leaf-like. Pl. covered with a dense, long, villosity, very rarely (v. *nudum* = *H. coerulescens* Steiger?) without hairs, the invol. only

*) ***H. dentatum hirtum* Lagg.!** Fr. is probably a distinct species. Stem ascending, ls firmer, less glaucous, narrower, gen. hairy on both sides, the caul. small; peduncles with glandiferous hairs mixed with the others. ***H. denticulatum* Schl. p.** non alior. should probably be connected with this form. Differing from *H. scorzonæfolium* in its habit, its stiffer and shorter hairs, its sinuate-dentate ls, hairy underneath. Rocky places; Rappaz! Alp. of Bex!

slightly villous. Heads large. Upper caul. ls broad, almost half-clasping. *H. pilosum* Lagg. exs. (form with narrow ls).—Alp., subalp. and Jura. 7

villosum Jacq. 1385. *)

Section 3. *Barbata*.

- 44 (33). Ls intensely glaucous, very villous above, almost or entirely glabr. underneath! Stem with neck very villous-woolly, often reddish, entirely covered with fine, very numerous and extremely long, hairs, gen. intermixed with very short glands.—W. (reported from above Fully); Piémont! Savoy! Dauphiné! gen. above 2000 m. 7

***subnivale** G. G. 1386.

- Ls green or faintly glaucous, hairy underneath, glabr. above, or hairy on both sides, or glabr. on both sides. 45

45. Stem 10—15 cm, gen. leafless and 1-headed (comp. var. b.), entirely covered with abundant long and simple hairs, but without glands or these scarcely visible. Ls gen. broader than in *H. glanduliferum*, always hairy. *H. Schraderi* Koch.—b. *ramiferum* Grml. (alpinum multiflorum Schl.!) Stem bearing 2—4 heads and 2—3 fairly developed (but always narrowed at the base) caul. ls. Pl. very villous.—High Alp.; b. Albula! Simplon! Saasthal! Javernaz! 7

piliferum Hoppe. 1387.

- Stem 10—15 cm, thick, almost always leafless and 1-headed (rarely with 2 heads and 2—3 small ls), covered with short, black, gen. very abundant glands, but almost without long simple hairs, or these only few and high up. Ls gen. narrow.—Varied: ls very villous to (v. *calvescens*) almost or entirely glabr. Easily distinguished from *H. alpinum* by its glandless ls and glabr. ligules.—High Alp. 7 **glanduliferum** Hopp. 1388. *)

- Stem taller, 20—35 cm, slenderer, gen. bearing 2—4 heads, covered above with glands (often not numerous) and simple scattered hairs. Ls often fairly glabr., the rad. narrowed insensibly to the base. Heads distinctly smaller than in the last, and with a shorter villosity. Fls gen. tubular, with prominent, livid, styles. *H. Murithianum* Favre! 1873. *H. penninum* Rap. in.!—b. *trichocladum* Arv.-Touv.! Stem lower, bearing 1—2 heads, covered with

*) The beautiful *H. eriophyllum* Willd. (*villosolanicum* Reut.) with hairs very long, extremely numerous, rather crisp and faintly plumose, is found in the vallée de Cogne (to the S.E. of Montblanc); common in the maritime Alps.!

*) *H. glanduliferum insigne* Favre! from the Simplon, has the broad ls and dense villosity of *H. piliferum*, but with numerous long (!) glandiferous hairs; perhaps a hybrid form?—*H. fuliginatum* (*glandulifer.-pilifer.*) **Hut. Gaud.**! which Christener notes in Br. on the Simplon, we have only seen in the Tyrol.

abundant stellate hairs.—Southern Alp.; Simplon! St. Bernard! b. Zermatt (Buser!). 7

armerioides Arv.-Touv. 1389.*)

Section 4. *Lanifera*.

- 46 (29). Stem leafless or only with 1—2 narrow ls placed at the ramifications. Ls hairy on both sides, thin, with almost entire edges, the rad. large, obovate or oblong-obovate, without a distinct petiole. Stem very woolly at the base. *H. saxatile* Vill. not Jacq.—Mont Chemin near Martigny: E. Thomas 1849! but never found again since then. 7 * **Lawsonii** Vill. 1390.

— Stem gen. bearing several developed caul. ls. Ls gen. glabr. above 47

Section 5. *Cerinthella*.

47. Invol. villous with long hairs. Ls gen. entire, the rad. narrow lanceolate, very long (up to 15 cm), narrowed very gradually to a long petiole, bearded with long hairs. Stem stiff. Heads large, with long, almost rayed, ligules. Pl. gen. more vigorous than *H. scorzonærfolium* and distinguished from it and the other *Villosa* by its pubescent-glandular peduncles and its ciliate ligules. *H. cerinthoides* G. G. p., *H. flexuosum* var. a. and b. Gaud.!—Alp., rare; G. W.! V.! U. 7

longifolium Schl.! 1391.

- Invol. blackish, without long hairs, or these not numerous, scattered. Ls thin, very acute, with distant teeth, the rad. slightly spathulate, narrowed insensibly or rather suddenly into the petiole. Stem slender. *H. juranum* Rap. nec Fr., *H. decipiens* Monn.—Alp. and Jura, but only Canton Vaud. 7 . . . **vogesiacum** Moug. 1392.

- 48 (25). Invol. ls numerous, imbricated, covered with a, more or less, dense and long villosity. Stem 1-headed or bearing several heads on long branches springing from the axils of, more or less developed, ls. High alpine pl. Type of *H. alpinum* 49

- Invol. ls less numerous and not or scarcely imbricated, without or almost without the long villosity. Stem terminated by a corymb of few or several heads. Inflor.

*) **H. Halleri tubulosum** Gaud. herb.! (Wall.), very nearly allied to *H. nigritellum* Arv.-Touv.! deserves further observation. **H. nigritellum** resembles *H. armerioides*, but the stem and ls are much more hairy, the invol. ls more obtuse. The stem (in the specimens found on the Simplon by Wolf) is div. below the middle or in the lower quarter into 2 long 1-headed branches. — **H. ustulatum** Arv.-Touv.! is near to *H. nigritellum*, but the invol. is less villous, the stem on the other hand very glandular.—**H. dasytrichum** Arv.-Touv. which, according to the author, is hybrid between *H. villosum* and *glanduliferum*, is still more hairy and almost without glands; the caul. ls are more developed and the invol. ls narrowed-acute.

escence more thickly set, but with longer branches than in the *Pulmonarea*. (Ls toothed. Invol. covered with numerous black, glandiferous hairs) 50

Section 6. *Alpina*.

49. Styles yellow (brownish in the var. *tubulosum*). Invol. ls acute or subacute, the outer ones lax. Stem gen. not tall, 1-headed and leafless or with 1—2 reduced ls. Ls thin, the rad. oblong-spathulate, subobtuse at the top, with a long narrowed cuneiform base, the edges almost entire; but varied: b. *Halleri* Vill. Ls oblong-lanceolate, acute, coarsely sinuate-dentate, more distinctly petioled; stem often taller, with 2—3 ls and 2—3 heads.—Further varied: Fls often tubular; invol. closed (v. *tubulosum*). Species distinguished by its spathulate ls, covered with glandular hairs, and by its ligules with long ciliæ! —High Alp. 6, 7 **alpinum** L. 1393.
- Styles of a blackish brown. Invol. ls finely acuminate, the outer appressed. Stem slightly arched, covered below with more numerous stellate hairs than in *H. alpinum* *Halleri*. Rad. ls with long narrowed base, inciso-dentate or almost pinnatifid. Terminal head often exceeded by the arched-ascending peduncle of the lateral, lower head! *H. fuliginosum* Rehb. f. not Læst.—High Alp., rare; G.! W.! V. O. 7 **rhæticum** Fr. 1394.

Section 7. *Atrata*.

50. Stem leafless or with 1 leaf. Invol. ls acuminate. Habit of *H. murorum*, but ls (always?) with a few scattered glands, the rad. narrowed at the base. Stem bearing 2—5 heads on straight, almost erect, branches; invol. swollen, black. *H. nigrescens* Lagg. ex.! not Willd. —Alp., rare; G. W. U. 8 **atratum** Fr. 1395.
- Stem bearing 3—5 ls; rad. ls not numerous or partly withered. Invol. ls gen. obtuse. Habit of an *H. vulgatum* rather low and with large heads. Ls soft, rather shining, sinuate-dentate, with long hairs which are often thickened at the base. *H. hispidum* Fr. not Forsk.—Alp., rare; G.! W.! 8 **Bocconeii** Grisb. 1396.

Section 8. *Subprenanthoidea*.

- 51 (30). Stem hollow, flexible, 20—30 cm high, bearing 2—3 ls and 2—6 heads. Peduncles and invol. grayish white on account of the numerous stellate hairs, accompanied by simple grayish and rare glandiferous hairs. Branches, when existing, arched-ascending, almost as in *H. murorum*. Rad. ls several, oval or elliptic, insensibly narrowed to the petiole, with entire or faintly toothed edges.

Alp., very rare; Eginenthal in Wall., 2000—2200 m. 8
macilentum Fr. 1397. *)

- Stem 20—25 cm, bearing 3—4 ls and 1—4 heads. Peduncles and invols with numerous stellate hairs, simple grayish hairs and fairly numerous glands. Branches, when existing, straight and fairly erect. Rad. ls gen. only 1—2, oblong-lanceolate, with distant teeth, insensibly narrowed at the base. Invol. ls rather more acute than in the last. Differing from *H. pseudoporrectum*, *Bocconeii* and *dentatum* in its half-clasping lowest caul. l.; from *H. pseudoporrectum* in its fairly glandular peduncles, its invols covered with numerous stellate hairs, its invol. ls more obtuse and its ligules ciliate; from *H. Bocconeii* in its villous invols; from *H. dentatum* in its less acute invol. ls, covered with numerous stellate hairs; in its ciliate ligules and glandular peduncles. *H. dentatum salævense macrophyllum* Fr., *H. atratum-macilentum* ex Favrat.—Alp., very rare; Eginenthal in Wall. 8 . . . **gombense** Lagg. ! 1398.

- Stem 30—40 cm, bearing 3—7 ls and several or many heads. Peduncles with abundant glands accompanied or not by stellate hairs, but without simple hairs or more rarely these latter few and scattered. Rad. ls gen. only 1—2, narrowed insensibly (often obliquely) to a long petiole. Invol. as in *H. prenanthoides* from which it differs in the caul. ls being less numerous**), distinctly toothed, less or hardly fiddle-shaped, in the rad. ls which exist during flowering-time having long petioles, and in the reddish brown fr. It differs from *H. vulgatum* in having caul. ls slightly clasping, sometimes rather fiddle-shaped, gen. more net-veined underneath, in its ligules gen. being ciliate, and in its red-brown (not black) fr. Probably a collective species! *H. juranum* Fr. non Rap., *H. murorum-prenanthoides* F. Schultz! *H. elatum* Reut. ! not Fr., *H. cydonifolium* Thom. Heg. ! Schl. ! non Vill. nec Koch, *H. elatum* G. G. quoad loc. vales., *H. denticulatum* Gris. ex syn. Rchb. f., *H. molle* Lagg. exs. ! *H. Laggeri* Schultz bip. ! *H. Chailleti* Gaud. herb. ! (planta juran.)—Subalp.; G. W. ! V. ! Freibg., Glarus (Sandalp); Jura. 7, earlier than *H. prenanthoides*

jurassicum Grisb. 1399. ***)

*) *H. epimedium* Fr. has broad invol. ls, quite obtuse, darker, very glandular, in Savoy (Mirantin!) and the Tyrol! perhaps also in Switzerland.

**) The more numerous the caul. ls, the fewer the rad. ls, and vice-versa.

***) *H. papyraceum* Gren. ! (Mont d'Or) resembles *H. vulgatum pseudomurorum*, but has half-clasping caul. ls.—Other similar forms are *H. ellipticum* Jord. ! and *H. subalpinum* Arv.-Touv. !—*H. dronicifolium* Arv.-Touv. ! which, according to the author, is found in the neighbouring Savoy, at the foot of the Dent d'Oche, belongs also to this group.

- 52 (31). Invol. slight, invol. ls not numerous, not imbricate. Ls more or less fiddle-shaped, gen. entire, with a net-work (often close) of veins underneath. Achenes pale brownish yellow or light red-brown **53**
 — Invol. rather thicker, invol. ls slightly imbricate (but less so than in the *Sabauda*). Ls not, or indistinctly fiddle-shaped. Comp. also *H. valdepilosum* . . . **56**

Section 9. *Euprenanthoidea*.

53. Peduncles only with scattered and unequal glands, but with numerous very long non-glandiferous hairs. Invol. ls acute or acuminate, more rarely obtuse. Stem gen. bearing only few, fairly large, heads. Ls close set, the upper broad, oval. Achenes light grayish yellow, as in *H. prenanthoides*, or light red. Hairs long. Intermediate between *H. villosum* (or *elongatum*) and *H. prenanthoides*, and perhaps hybrid. Ls more net-veined than in *H. elongatum*, distinctly cordate-clasping, the lower ones rather fiddle-shaped, rad. ls 0. Ligules ciliate. Achenes not blackish brown. *H. virescens* Schl.!—b. *Wolffi* Grml. (*H. cydonifolium* Arv.-Touv.? an Vill.? nec Fr.). Pl. 20 cm high; ls narrow; heads small; invol. ls obtuse.—Alp. and subalp., rare; G.! W.! V.! B.! O.; b. St. Bernard. 7, earlier than *H. prenanthoides* . . . **valdepilosum** Vill. 1400.
 — Peduncles with abundant, and gen. short, glandiferous hairs, often without, or with only scattered, simple hairs. Invol. ls obtuse. Type of *H. prenanthoides* . . . **54**
 54. Ls rather firm, often less glaucous and less net-veined underneath than in *H. prenanthoides*, fairly regular in form, narrow, crowded, hardly fiddle-shaped. Heads not numerous, often rather larger and on stronger, less spreading, peduncles. Invol. often rather blackish after being dried. *H. cydonifolium* Rehb. f. Icon. t. 155., *cotoneifolium* Fröl. Heg. not Lam.?—Alp., rare; Wall., Vaud, Freibg. (Eginenthal! Crans sur Lens! Simplon! St. Bernard! Mont Claude! Bovonnaz), Graub. (Brügg.). **strictum** Fr. 1401.*)
 — Ls thin, glaucous underneath and with a small meshed net-work of veins, distinctly fiddle-shaped. Invol. slender**) **55**
 55. Ripe achenes of a pale grayish yellow, rarely light reddish-brown. Heads fairly small, numerous on large

*) *H. lanceolatum* (boreale-prenanthoides) **Arv.-Touv.**! which, according to the author, grows in Switzerland, might, judging by the ls and the pale achenes, be an hybrid form of *H. prenanthoides*.

) *H. præruptorum* **Godr. (prenanthoides-vogesiacum Gr. G. Rehb. f.) has ls not fiddle-shaped, coarsely inciso-dentate. See N. Beitr. III, 19.

pls, panicled on slender, spreading peduncles.—Alp. and subalp., Creux du Van in the Jura. 8

prenanthoides Vill. 1402.

- Achenes of a light red-brown. Heads not very numerous on branches which do not spread so much. Ls with large auricles which overlap one another, the upper ones broader than in the last.—Debris at the foot of the Wetterhorn! Allières, Canton Freibg.! Realp, Sembranchier, Alp de Bex. Easily distinguished from *H. ramosissimum* by its ls being without glands. 8 **perfoliatum Fröl. 1403.*)**

Section 10. *Subsabauda*.

- 56 (52). Achenes red-brown. Ls toothed, not, or indistinctly, net-veined. Ligules glabr. or feebly ciliate. Invol. ls rather pale. Stem covered up to the top with long hairs, often much thickened at the base. Differing from *H. prenanthoides* in its stem being stiffer and more furrowed: its ls often broader, toothed, not fiddle-shaped and less net-veined; its heads rather larger and thicker; and in the colour of its achenes. Differing from *H. boreale* in its distinctly clasping ls, its glandular peduncles, its, often ciliate, ligules, and its lighter coloured achenes. *H. sylvaticum* Schl.! *H. sabaudum* var. c. b. Gaud.!—b. *bifrons* Arr.-Tour.! Pl. very hairy, with stiff, few-headed branches; ls thin, more clasping, the lower ones much narrowed at the base.—Mount. and subalp.; T. W. V.; b. Orsières. 8 **valesiacum Fr. 1404.**
- Achenes of a light grayish yellow, or light red-brown. Ls deeply inciso-dentate, faintly net-veined underneath. Ligules glabr. or ciliate. Invol. ls with pale green edges. Stem hollow (?). Glandiferous hairs of the peduncles very short.—Var.: a. *typicum*. Achenes pale; ligules ciliate.—b. *helveticum* Grml. Achenes of a light red-brown; ligules glabr. (always?); the latter also varied: ls thinner, paler, or: ls firmer, darker green, often streaked with red.—Rolle, Neuchâtel! Bienne, Wykon! Berneck, Sargans (according to Wartm. and Schlatt.). 9 **lycopifolium Fröl. 1405.**
 - Achenes light grayish yellow as in *H. prenanthoides*. Ls with almost entire edges or slightly denticulate, not or hardly net-veined underneath. Ligules glabr. Invol. ls pale at the edges. Pl. recalling *H. boreale* in habit, but differing in the colour of its achenes, its invol. ls with pale edges, its glandular peduncles, &c.

*) According to Freyn, also at the Creux du Van and at Salève which we doubt much. Here also *H. papyraceum* Schultz bip. non Gren. must be placed.

—Edges of woods and thickets; Jorat near Lausanne. A late species not blooming till about the middle of September **Favrati Muret.!** 1406.

- Achenes reddish brown. Ls sinuate-dentate, distinctly net-veined underneath. Ligules glabr. or feebly ciliate. Invol. blackish, with, scarcely visible, stellate hairs, without simple hairs, but with extremely numerous blackish glandular hairs of medium length. *H. boreale-jurassicum?* Reut. Resembling *H. corymbosum*. — **Salève. 9 melanotrichum Reut.!** 1406a.

Section 11. *Picroidea*.

- 57 (26). Branches spreading. Upper ls broad, almost oval. Glandiferous hairs on the peduncles yellowish. Fl. bright yellow. Achenes reddish brown. Stem 40—60 cm, stiff, branchy, often from the base, bearing several or many heads. Ls of a rather yellowish green, gen. sinuate-dentate, less commonly with almost entire edges, hardly net-veined underneath, the lower ones not fiddle-shaped. Hairs not all, or rarely all, glandiferous. Recalling *H. amplexicaule*, but the pl. is aphyllopodous, more leafy, and the receptacle not villous. *H. prenanthoides perfoliatum* Fr. (not *H. perfoliatum* Fröl.), *H. picroides ramosissimum* Fröl., *H. prenanthoides multiflorum a. foliis dentatis* Gaud.!, *H. sabaudum hybridum* Gaud.!, *H. amplexicaule-prenanthoides* Arv.-Touv.!(no hybrid).—Shady rocks of Wall. (Naters, Viège, Unterbach, Pencec). 8

ramosissimum Schl. Heg.! 1407.*)

- Branches erect or slightly spreading. Upper ls oblong-lanceolate. Glandiferous hairs of the peduncles more or less blackish, some of them very long. Fl. pale yellow **58**
58. Stem 45—60 cm, terminated by a corymb of few or several heads. Ls net-veined underneath, the lower ones slightly fiddle-shaped, the others distinctly clasping, with entire or faintly toothed edges. Ligules distinctly ciliate. Achenes pale. *H. cydonifolium* Fr. not Vill. *H. lanceolatum* Schl.!, not Vill.—a. *typicum*. Hairs of the ls all glandiferous; invol. blackish.—b. *piliferum Grml.* Some of the hairs of the ls not glandular; invol.

*) This form from Wallis = var. **Schleicheri Burnat and Greml.** (*H. helveticum* Arv.-Touv.!, spic. 1881 nec alior). Different forms (or species?) of southern France and Piémont are: **H. lactucæfolium Arv.-Touv.!** **H. conringiæfolium Arv.-Touv.!** **H. Crissolense Boiss. and Reut.** and **H. Pesianum Burnat and Greml.**, forms which are closer to *H. prenanthoides*.—Another allied, hypophyllopodous form: **H. viscosum Arv.-Touv.!** approaches the *Amplexicaulia* still more than *H. ramosiss.* and is reported by the author from Wall. (not. 1833) probably through confusion with this last.

paler, with more abundant stellate hairs; ls more often toothed; approaching *H. picroides*.—c. *Schneideri* Grm! As the var. b. but ls sinuate-dentate; heads more numerous (up to 40 and more), distinctly smaller; glandiferous hairs of the peduncles shorter.—Alp., rare; Sils! between Hospenthal and Zumdorf! Gorges d'Alesse! var. b. Maria Sils! Grimsel! Maienwand! Eginenthal! St. Bernard! var. c. Gerenthal, Upper Wallis, in company with b. 8 . . . **ochroleucum Schl.! 1408.**

- Stem lower, 15—25 cm, bearing 1—5 heads! the lateral peduncles gen. in the axils of developed ls (not bract-like). Ls not net-veined underneath, not fiddle-shaped and only half-clasping, sinuate-dentate. Ligules gen. feebly ciliate or glabr. Achenes light red. Some of the hairs of the ls always not-glandular. Often resembling *H. intybaceum* and *H. Bocconeii*.—Alp., very rare*)
picroides Vill. 1409.

Section 12. *Intybacea*.

- 59 (24. 26). Ls light green, long-lanceolate, sinuate-dentate, narrowed at the base. Hairs all glandiferous. Outer invol. ls spreading, lighter green. Fls very pale yellow. *H. albidum* Vill.—Alp. and subalp. 8
intybaceum Wulf. 1410.

Section 13. *Amplexicaulia*.

- 60 (25). Ls thin, rather glaucous, with almost entire edges. Styles yellow. Stem rarely exceeding 20 cm, few-headed, gen. only bearing 2 ls. Ls not viscous; their hairs all glandiferous. *H. cerinthoides* Thom. Schl.! not L., *H. Reuteri* Rehb. f.—Mount. and subalp. (Alp. and Jura) of western Switz., not common. 7
Pseudocerinthe Koch. 1411.

- Ls thicker, gen. green, more or less sinuate-dentate. Styles gen. brownish. Type of *H. amplexicaule* . **61**
61. Hairs of the ls all glandiferous, rarely on the lower ls mixed with longer non-glandiferous hairs. Upper ls (those of the branches) broad, with broad bases, half-clasping (rarely narrower, not clasping: v. *petræum* Hopp?). Pl. viscous, bearing several or many

*) Probably a collective species or, rather, composed of various hybrid forms. Here are found: ***H. ochroleucum-prenanthoides* Favre** (St. Bernard), ***H. intybaceum-ochroleucum piliferum* Favrat!** (Maienwand, inter parentes; much resembling *H. intybaceum*); also: ***H. Huteri* Hausm.!** ***H. Ganderi* Hut.!** ***H. macrocephalum* Hut.!** ***H. lutescens* Hut.!** the last approaching *H. ochroleucum piliferum* in its taller, many-headed stems, its more clasping ls which are rather more net-veined underneath and its invols with more numerous stellate hairs. The pl. of Villars (Valserberg, Graub.) appears to be an ***H. intybaceum-prenanthoides***.

- heads; branches bearing small ls and heads often partly suppressed.—Rocks and walls, especially of the mount. and subalp.; distrib. 7 **amplexicaule** L. 1412.
- Hairs (especially of the lower ls) at any rate partly without glands **62**
62. Invol. with yellowish glandiferous hairs neither very long or numerous. Styles yellow. Stem branched, often from the base, covered entirely with numerous white, rather stiff, hairs. Caul. ls not or half-clasping. Heads large, with long, almost rayed, feebly ciliate, ligules. *H. amplexicaule* opimum Fr.! *H. ligusticum* Reut.! not Fr.—Salève! in company with *H. amplexic.* and *humile*. Fort de l'Ecluse! Yverdon! 7 **Reichenbachii** Verl. 1413.)*
- Invol. with glandiferous hairs, fairly long and numerous, and gen. blackish, but without, or only with scattered, simple hairs. Styles gen. livid (brownish). Stem branchy, or only so above. Very near to *H. amplexicaule*, but some of the hairs are always without glands, the branches often more erect, the glandiferous hairs of the inflorescence gen. blackish, the invol. with more numerous stellate hairs, and the caul. ls narrower and not usually clasping.—b. *glaucescens* Grml. (*H. valesiacum* Reut.! non Fr.). Ls glaucous, sometimes almost glabr. above; hairs more distinctly denticulate; stem not tall.—As *H. amplexicaule*, but, in general, rather rarer; b. Wall. (Simplon! Iserablosz!). 7 **pulmonarioides** Vill. 1414.
- Invol. with short, black glandiferous hairs, and with fairly numerous longer hairs which are simple and black at the base. Styles yellow. Pl. in other respects approaching the last, but the stem less leafy, ls thinner, inflorescence less separated; branches long, less spreading, without, or with small, ls; upper ls entire, often almost glabr. above; invol. ls appressed; fls dark yellow. *H. amplexicaule aureum* Gaud.! Mount. and subalp., rare; W. (Lourtier, Iserablosz), O. (Meiringen: Christener), U.? 7 **ligusticum** Fr. 1415.

Section 14. *Rupicola*.

- 63 (24). Ls oval-oblong, coarsely inciso-dentate or pinnatifid, rarely (v. *subintegrifolium* Ser.!) almost entire; the lowest caul. leaf often of the same form as the rad. ls, and petioled. Stem not tall, slightly arched, bearing 2—3 ls and div. into 2 or several long, 1-headed branches. Invol. ls with long, white, spreading hairs, obtuse, the inner ones pale. *H. Jacquini* Vill., *H. brachiatum* Schl.! *H. nigrescens* Schl.!—b. *glabrescens* Grml. Ls rather

*) A very similar form is ***H. utricaceum*** (amplexic.-humile) **Arv.-Touv.**!

glaucous, almost glabr. above.—Fissures of rocks in the mount. and subalp., fairly distrib. but not common; b. W. (Rappaz). 7 **humile Jacq. 1416.**

- Ls narrower than in the last, lanceolate, with a long attenuation at the base, sinuate-incised or pinnatifid, with teeth (or segments) directed forwards, the upper narrow, almost linear, long-acuminate, and with entire margins. Otherwise very like the last, but the hairs rather longer and stiffer. *H. rupestre* Heg. not All.! *H. Heerii* Brugg!—As the last, but only in eastern Switz.; G. U. A. 7 **lacerum Reut.! 1417.**

- Ls (glandular at the edges) resembling those of *H. murorum*, petioled, irreg., coarsely, and deeply toothed at the base, or almost pinnatifid, with segments often separated from the limb; upper ls long, narrow, linear, entire, or with 1—2 long, narrow, often hastate, lobes. Stem slenderer than in *H. humile*, 20—45 cm high, with 1 or 2 ls, bearing 2 heads, or div. into long branches terminated by 1—3 heads. *H. humile-murorum*?—Binn? Bex! Montbovon! The Stockhorn chain! 7

* **Cotteti God. 1418.**

- Ls long, narrow-lanceolate (the lower ones with a petiole 10—12 cm long, 12—15 mm broad); the middle ones, in particular, irreg. inciso-dentate, with acuminate teeth directed forwards; the lower with a long and gradual attenuation to the base; the upper linear, entire. Stem 20—35 cm, bearing 4—5 ls and 1—3 heads, thickly covered above with stellate hairs, but the invol. without stellate hairs. Stem and invol. with long, scattered hairs and not many short glandiferous hairs. Heads large, on long, arched peduncles. *H. humile-scorzonerifolium*? *H. humile-petrophilum* God.!—Creux du Van. 7, 8

Godeti Christen.! 1419. *)

- Ls petioled, broad-lanceolate, lightly toothed at the base. Stem ascending, bearing 1—2 ls, with long, arched branches terminated by 1—2 heads. Heads, invol. and indument as in *H. humile*. Resembling the last. —Rocks near Montbovon (Christener). 7

* **adenophyllum Scheele. 1420.**

Section 15. *Lanatella*.

- 64 (21). Ls glabr. above, more or less glaucous, spotted with dark violet. Peduncles always with glandiferous hairs (but sometimes rare). Pl. recalling in habit *H. murorum* and *præcox*, but the hairs of the ls rather crisp, plumose. Stem with longer branches. *H. andryaloides*

*) According to Arv.-Touv. in litt. = **H. leucophacum Gr. God.**

- pictum Koch., *H. murorum pictum* Gaud.! p.—Very variable: Ls sometimes pinnatifid-lacinate (Nax), or almost entirely black (Sion).—b. *Gremlii* Wolf (*H. murorum ramosum nudicaule* Gaud.!). Ls of a purer green, hardly spotted, narrower, longer, without a distinct petiole, sinuate-dentate, with acute teeth.*)—c. *paradoxum* Grml. (*H. pictum*-*Trachselianum*?) Stem higher, often branching from the base, bearing several or many ls, and many heads; peduncles not glandular; invols gray with stellate hairs and covered besides with a short villosity.—Rocky places of Wall. and Vaud; b. Brieg; c. Sepey near Aigle. 7 . . . **pictum Schl.! 1421.**
- Ls always hairy on both sides **65**

Section 16. *Lanata.*

65. Ls with entire or only faintly toothed edges, thick, and gen. covered with a dense woolly coating like those of *Verbascum Thapsus*. *H. tomentosum* All. Fr. (*H. lanatum* Fr., another near species = *H. Waldsteinii* Tausch.).—b. *Laggeri* Jord. nec Fr. (*H. andryaloides intermedium* Gaud.! *H. lanatum-pulmonarioides* Favrat). Heads rather smaller, supported by longer peduncles, covered sometimes with short glandiferous hairs; hairs gen. rather longer; ligules often slightly ciliate.—Rocky places: Wall., Salève, Neuchâtel (Noiraigues), upper Simmenthal near Schwarzmatt; b. Binntal. 7 **lanatum Vill. 1422.**)**
- Lower ls (rosetted) inciso-dentate, or almost incispinnatifid at the base. Stem gen. lower, less leafy, and with longer branches than in the last. Hairs gen. less dense, heads rather smaller, ligules feebly ciliate.—As the last; only at Salève, not in Wall. 6, 7
- * **andryaloides Vill. 1423.**
- 66 (30). Hairs of the l.-margins long, stiff (bristle-like), so that the ls appear to have long ciliæ. Stem leafless or with 1—2 ls.***) Ls glaucous, the rad. more or less narrowed at the base (comp. *H. rupicolum* var.). Styles yellow. Hitherto only in Wall. **67**

*) *H. rupestre* All! nec Rap. neque Heg. which resembles this form, and which, according to Fröl. and Fries, should grow in Switzerland, does not differ at all except in its gen. leafless and 1-headed stem, its rather larger achenes (4—4½ mm long) and in habit in which it resembles a *Leontodon*.—*H. farinulentum* Jord.! differs from *H. pictum* in its stem being covered with more numerous stellate hairs, and its non-glandular peduncles; this last is found in Piémont and Savoy!

**) *H. pteropogon* Arv.-Touv.! indicated by the author as growing in Switzerland, we have only seen in France. See N. Beitr. III, 16.

***) *H. subrupe* Arv.-Touv.! (Almogell in Wall.) with stem bearing 2—4 ls, see N. Beitr. III, 49.

- Hairs of the l.-margins shorter and softer, rarely rather bristly, but then the rad. ls broad at the base. Styles brownish or dirty yellow **68**

Section 17. *Oreadea*. (Type of *H. Schmidtii*.)

67. Invol. with fairly rare stellate hairs, but with more or less abundant glandiferous hairs, which gives them a darker colour. Ligules often feebly ciliate. *H. pallidum* Fr., *H. bifidum* Schl.! *H. Favrei* Wolf!*)
—Alp. and subalp. on granite; Wall. 7

Schmidtii Tausch. 1424.

- Invol. densely covered with stellate hairs, gray; peduncles not very, or not at all, glandular. Ls often thinner than in the last, gen. with longer petioles, often not much narrowed at the base, the younger ones, at any rate, furnished with stellate hairs underneath. Heads large, with long, not-ciliate ligules, and narrowed-acuminate invol. ls; the latter slightly more imbricated than *H. præcox*. *H. bifidum* Koch?, *H. pallidiforme* Arv.-Touv.!—b. *Wolfianum Favre!* Ls with finer hairs, broad at the base; form approaching *H. præcox*.—W. (Arbatz, Balen, Einfischthal); b. Bovernier. 7

rupicolum Fr. 1425.

Section 18. *Vulgata*.

- 68 (66). Peduncles without glandiferous hairs or these rare (and short!). Ls glaucous, often sinuate-dentate, more or less narrowed at the base, gen. glabr. above, often with stellate hairs below, the caul. 0—2. Styles gen. livid **69**

- Peduncles glandular, rarely without glands in the alpine forms or in the forms with leafy stems **71**

69. Invol. gray in consequence of the dense stellate hairs, but without long simple hairs. Stem not tall, arched. Ls often spotted, unequal; the outer ones oblong, with distinctly separate petiole, sinuate-dentate, the inner linear-lanceolate, covered underneath with stellate hairs often very dense. Recalling the *Pulmonarea* rather than the *Glaucia*. *H. politum* Chr. p. not Fr., *H. Arveti* Grml. not Verl.? See N. Beitr. III, 17.—Gravelly places and edges of torrents in the Alp. and subalp.; G. in several places. S **Mureti Grml. 1426.**

- Invol. with long, simple, more or less numerous hairs **70**

*) For the allied species: *H. ceratodon*, *intricatum*, *cephalodes* Arv.-Touv.! see N. Beitr., III, 49.—*H. ovatum* Schl.! should be referred partly to *H. Schmidtii* and partly to *H. rupicolum*; these two species are in other respects often difficult to separate, especially when dry.

70. Ls unequal; the outer (often withered by the time of flowering) broader, oval, rather obtuse, or lanceolate-subacute; the inner elliptic-lanceolate or lanceolate, acuminate, sinuate-dentate, gen. with large, acuminate teeth directed forwards, with an insensible and long attenuation at the base. Branches more or less spreading, with scales in the upper portion. Caul. ls long, narrow. Recalling the *Glauca*! but invol. ls more acute. *H. saxatile* Schl.!, *H. rupestre* Schl.!, *Gaud.*! *Rap.*! not All., *H. oxydon* Fr., *H. petræum* Heg.—b. *hymenophyllum* Fr.! Ls glabr., thinner, distinctly broader, less toothed; very like *H. cæsium*.—Rocky places in the Alp. and subalp.; G. T. W. V. B. O. U.; b. Vaud, Freibg., Bern. 7
Trachselianum Christener! 1427.

- Ls oblong (gen. narrower than in *H. murorum*), shortly narrowed at the base, toothed or (v. *laciniatum* Heg.) sometimes pinnatifid. Branches, when existing, spreading little or almost erect. Habit of *H. murorum* or *H. præcox*, but stem gen. lower, few-headed, often glabr. and leafless; branches more erect, stiff, often arched and longer; invol. larger, more swollen, villous, glandless. *H. cæsioides* Arv.-Touv.—b. *Rionii* Grml. (*cæsium-oligocephalum* Grml. *) *H. subincisum* Arv.-Touv. saltem p.) Ls spotted, with broad bases, styles yellow; very nearly approaching *H. præcox*.—Alp. and subalp.; not common; G. W. V. O. U.; indicated also on the Creux du Van; b. Sion. 6 **cæsium Fr.! 1428.**

- 71 (68). Stem leafless or with 1—2 ls 72

- Stem bearing 3—several ls. (Rad. ls gen. more or less narrowed at the base) 74

72. Rad. ls insensibly narrowed at the base. Comp. *H. atratum*. 50.

- Rad. ls with truncate base, or rounded or slightly cordate, rarely shortly narrowed. Type of *H. murorum* 73

73. Ls glaucous, gen. spotted, glabr. above, or, if hairy, the hairs are longer and stiffer than in *H. murorum*; pl. otherwise very like this last. *H. glaucinum* (Jord.!) Grml., *H. fragile* Fr., *H. lasiophyllum* God.!, not Koch, *H. Pollichia* Schultz bip.!, *H. Lingensfelderi* Schultz bip. Lagg. exs.!, *H. murorum plumbeum* Grisb. Rehb. f.—b. *cinerascens* Jord.!, Ls covered above with numerous long, stiff, bristle-like hairs; resembling *H. lasiophyllum* Koch.—c. *Verloti* Jord. (*pilosissimum* Fr. p. Grml.) Rad. ls rather narrowed at the base, gen. sinuate-dentate with acute teeth, and petiole bearded

*) On *H. oligocephalum* Arv.-Touv. see N. Beitr. III, 16.

with long hairs; glandiferous hairs of the inflorescence very numerous, some of them very long; ligules (always?) feebly ciliate; form approaching *H. Schmidtii* and probably a good species.—d. *alpicolum* Grm! (subcæsium Fr. p., *H. incisum* Koch p. not Hopp., *H. senile* Kern.?, *H. apiculatum* God. exs.!) Analogous form of *H. murorum* alpestre; differing from *H. cæsium* in the form of the ls, the inflorescence, the invol., and the colour of the styles.—Woods, thickets and walls, often in company with *H. murorum*; G.! W.! V.! Z.! J.! S.! and probably distrib.; b. between Viège and Stalden! c. Salève; rather earlier (5) than *H. murorum*, but flowering, like it, into the autumn **præcox Schultz bip.! 1429.**

- Ls green, gen. not spotted, hairy on both sides; hairs short and soft. Branches gen. arched-ascending or very spreading. Very variable; sometimes with small heads (var. *microcephalum**).—b. *alpestre* Grisb. (subcæsium Fr. p.) alpine form, almost or entirely glandless, with few heads.—As the last, everywhere. 6

murorum auct. 1430.

- 74 (71). Peduncles more or less glandular. Stem bearing several or many heads. Achenes blackish brown. Differing from *H. murorum* in its less numerous rad. ls, insensibly narrowed to the base, in its more numerous caul. ls, in its stem gen. rough below, its branches gen. not arched, and in its rather later bloom. *H. sylvaticum* Lam. Very variable:—b. *pseudomurorum* (umbrosum Jord.? fastigiatum Fr.?) Ls thin, light green, the rad. almost rounded at the base, with distinctly separate petioles; the caul. only 2—3 in number; branches slightly arched, often leaf-axillary; approaching *H. murorum*.*—c. *sempronianum* Wolf! Stem and ls covered, at least in the lower part of the pl. with numerous long, white, bristle-like hairs; ls rather glaucous, firmer; invol. ls rather imbricate.—Woods and thickets, distrib.; b. Ardon, Leukerbad, Sion; c. Simplon; Brigue. 7

vulgatum Fr. 1431.

- Peduncles glandular. Stem few-headed. Achenes red-brown. Comp. *H. Bocconeii*. 50.
- Peduncles without glands 74b.

74b. Caul. ls about 3—5, distant, the lower petioled; rad. ls 1—3, deeply sinuate-dentate, with acute teeth. Styles

*) Another intermediate form between *H. vulgatum* and *H. murorum* is ***H. oblongum* (Jord.)** Rap.! from Valleyeres.—A form requiring further examination is ***H. vulgatum* (sylvaticum) integrifolium Christen**, which has erroneously been taken for ***H. diaphanum* Fr.**

- yellow (?), *H. ramosum* Sendtn. not W. K.*), *H. argutidens monacense* Fr.!—Chur: Brügg (Munich!) 5, 6, earlier than *H. vulgatum* . . . **Sendtneri Näg.! 1432.**
- Caul. ls 6—20, close-set, sessile, suddenly reduced and the upper transformed to scales; rad. ls clustered above the base of the stem, long-lanceolate, sinuate-dentate. Styles brownish. Pl. also recalling the *Sabauda* by its slightly imbricate invol. ls.**)—Poschiavo: Brügg., Mandello on the lake of Como! . . . **australe Fr. 1432b.**
- 75 (31). Some of the invol. ls spreading-reflexed at the top (comp. *H. brevifolium*). Styles often yellow. Upper branches gen. crowded in the form of an umbel **80**
- Invol. ls appressed. Styles gen. livid. Branches not arranged in an umbel . . . **76**
76. Invol. ls only forming a few rows, the inner slightly narrowed, often subacute. Caul. ls of a medium number **77**
- Invol. ls in several rows, distinctly imbricate, all distinctly obtuse. Caul. ls very numerous. Late species! **78**

Section 19. *Tridentata*.

77. Invol. ls gen. with scattered, simple hairs, and stellate hairs, the edges pale green, not changing at all in drying, the inner linear, almost equal in width. Differing from *H. boreale* in its slenderer, hollow stems, in its less numerous, narrower ls, which have a long attenuation at both ends, with 2—3 large teeth on each side, in its slightly smaller heads, its invol. ls narrower, less obtuse, paler, and less imbricate, and its earlier time of flowering. Differing from *H. vulgatum* in its stems being without rad. ls, its lower caul. ls shortly petioled or sessile, its peduncles almost or entirely without glands, and its later bloom. *H. rigidum* Koch (and also Hartm. according to Lind.), *H. lævigatum* Schl.! *H. asperum* Schl. *H. sabaudum ambiguum* Gaud.! —Road-sides and thickets; probably distrib., but not common. 8 . . . **tridentatum Fr. 1433.**
- Invol. ls almost glabr., gen. without stellate hairs, easily becoming black in drying as in *H. boreale*; the inner ones broad at the base, then narrowed. Otherwise like the last. Stem gen. glabr., often red below; caul.

*) *H. ramosum* Schl.! the locality of which is unknown, is very like *H. ramosum* Lind. exs. 75. —*H. canescens* Schl.! (*murorum intermedium* Gaud.) a neighbour of the last, but with few (2—3) caul. ls, and with scattered glandiferous hairs, also appears doubtful to us. —*H. Dollineri* Schultz bip.! (*lævigatum* Griseb., *argutidens* Dollineri Fr.!) connected by Fries with this last, appears to us nearer to *H. Trachselianum*. —*H. murorum ramosum* var. *a. Gaud.* = *H. vulgatum*.

**) Species near to the section *Italica* (*H. Virgaurea* Coss., *H. italicum* Fr., *H. provinciale* Jord., *H. barbatum* Tausch.).

ls often with broader base and less prominent teeth. Fls dark yellow. *H. Friesii* Lind.! saltem p.—Mount. and subalp.; *G. W. V. O. U. A. 8 gothicum* Fr. 1434.

Section 20. *Sabauda*.

- 78 (76). Styles yellow. Ls very numerous (20 and more), distributed equally on the stem, the middle and upper ones fairly reg. in form, oblong-lanceolate, rounded at the base. Invol. ls narrower and less obtuse than in *H. boreale*, the outer ones rather lax. *H. corymbosum* Grml. not Fr.*)—W. (Bovernier), V. (below Morcles, Favrat!). 8 . . . *pseudocorymbosum* Grml. 1434b.
- Styles brown or almost black. Lower ls with their bases more or less narrowed, almost into a petiole, the upper different in shape. Invol. ls broad, obtuse . . . 79
79. Invol. especially after drying, blackish (rarely keeping their green colour), with ovoid base passing into a peduncle bearing several scales. Upper ls oval-lanceolate or lanceolate, with rounded or broad sessile base, rarely rather narrowed. *H. sylvestre* Tausch., *H. commutatum* Beck.—Very variable: inflorescence sometimes elongated into a raceme (v. *racemosum* Hausm.). Ls sometimes equally distributed sometimes crowded together about the middle of the stem, and then the upper ones suddenly reduced.—b. *sedunensis* Grml. (subhirsutum olim). Ls equally distributed, up to 50 in number, thin, covered on both sides, as also the stem, with numerous long white hairs; invol. pale, almost truncate at the base.—c. *subsabaudum*. Ls equally distributed, the upper ones broad, slightly cordate, often streaked with red, but invol. black when dried.—d. *croaticum* Schloss.? (virgultorum Favrat exs.! vagum Jord.?) Ls thin, fairly glabr. above, the lower ones crowded together a little above the base of the stem. Invol. pale. Recalling *H. provinciale* Jord.—Woods and thickets; everywhere; b. Sion: c. Wasserfluh near Aarau!, d. Jorat near Lausanne! 8 . . . *boreale* Fr. 1435.
- Invol. not turning black in drying, gen. covered with simple hairs, sometimes mixed with a few glandiferous hairs, larger than in the last, truncate at the base and passing suddenly into a peduncle which has fewer scales. Upper ls broad, oval, half-clasping. Stem stiff, often reddish. *H. autumnale* Grisb., *H. sabaudum maximum* Gaud.!—As the last, but very rare; indicated near Chur, Neuchâtel, Bern, Bâle; we have only seen cultivated specimens. 8 . . . *sabaudum* Fr. 1436.

*) *H. sabaudum* Rchb. f. t. 176 f. 1 resembles our pl.—*H. sabaudum* Grisb. nec Fr. appears to be *H. brevifolium*.

Section 21. *Umbellata*.

- 80 (75). Middle and upper ls broad, oval, broadly rounded at the base, or almost half-clasping, acute and furnished with acute teeth. Most of the invol. ls appressed. Recalling in habit a small *H. sabaudum* with few heads! *H. boreale sabaudum* Rehb. *f.* Icon. t. 182. *f.* 2 (Devens sur Bex). *H. sabaudum* Grisb.?—Lavey, chemin de Morcles ***brevifolium* Tausch. 1436b.**
- Middle and upper ls lanceolate or linear-lanceolate, more rarely (v. *linarifolium*) almost linear, more or less narrowed at the base, rarely (v. *latifolium*) oval-lanceolate or almost oval. Some of the invol. ls with spreading-reflexed tops. Varied also: ls with 3—5 prominent teeth, almost pectinate (v. *coronopifolium* Bernh.); also: dwarf form, with broad ls, and not many heads (v. *Lactaris* auct.).—b. *monticola* Jord.! (æstivum G. G. not Fr.). Stem lower, heads less numerous; invols darker; achenes red-brown; flowering almost a month earlier. —Edges of woods and thickets; distrib.; b. Verrières, Mont Brézon! 8 ***umbellatum* L. 1437.**

OBS. I. Hybrid, or partly intermediate and not hybrid, forms of the subgenus *Pilosella* *): *H. aurantiacum-Auricula*: *H. pyrrhantes* N. P., G. W. Montreux; *H. aurantiacum-furcatum*: *H. fulgens* N. P. (Moritzianum Heg. ?), eastern Alp.; *H. aurantiacum-glaciale*: *H. aurantellum* N. P. (corymbuliferum Arv.-Touv. saltem p.), Avers, St. Bernard; *H. aurantiacum-Hoppeanum*: *H. substoloniflorum* N. P. (Moritzianum Heg. ?) Splügen, Avers; *H. aurantiacum-Pilosella*: a. *H. stoloniflorum* W. K. nec alior **), forma intermedia (*H. fulgidum* and *Hausmanni* Rehb. *f.* *H. Sauteri* F. Schultz), Splügen, Pilatus.—b. *rubrum* Peter, forma accedens ad *aurantiacum*, Avers, Sion, St. Bernard; *H. Auriculacymosum*: *H. sciadophorum* N. P., Bernina-Heuthal (= *Auriculacymosum sabinum*), Rheintal (= *Auriculacymosum typicum*); *H. Auricula-florentinum*: *H. sulfurcum* Döll. (corymbuliferum Grml ?), Zermatt, Schaffh.; *H. Auricula-furcatum*: *H. brachycomum* N. P., Eastern Alps; *H. Auricula-glaciale*: *H. niphobium* N. P. (breviscapum Gaud, Smithii Arv.-Touv.), Graub., Wallis; *H. Auricula-Hoppeanum*: *H. latisquamum* N. P., Eastern Alp. (*Auricula-Hoppeanum* macranthum = *H. rubricatum* N. P., Bernhardin, Zugerberg ?); *H. Auricula-Peleterianum*: *H. xystolepium* N. P., Sion; *H. Auricula-Pilosella* ***):

*) Among the forms mentioned here, *H. adriaticum*, *albipedunculum auriculiforme*, *brachycomum*, *floribundum*, *hypeuryum*, *latisquamum*, *niphobium*, *permutatum*, *rubrum*, *substoloniflorum*, *trichodes* and *Umbella* are considered by Nägeli and Peter to be, some at any rate, **not hybrids**; but it is only by locality, and by considering the associations of the legitimate species among which they are found that any attempt can be made to determine their origin. Otherwise, the celebrated authors of the monograph consider also that *H. cruentum*, *furcatum*, *fuscum*, *Laggeri* and *Zizianum* (which appear as species in this work) are intermediate forms, not hybrids, not seeing the legitimate species (types, "Hauptarten") except in the 12 others.—In other respects, in order to determine these intermediate forms with any certainty, it is absolutely necessary, to begin with, to know perfectly the true species and their variations!

**) *H. stoloniflorum* Köch et auct. plur. = *H. flagellare* Willd., a species belonging to eastern Germany, intermediate between *H. collinum* and *H. Pilosella*.

***) Differing from *H. brachiatum* (*florentinum-Pilosella*) in its slenderer build, its ascending stems, its gen. more or less spathulate ls, and its hairs being less stiff.

H. auriculiforme Fr. (*auriculifolium* Grml., *Schultesii* F. Sch.), not rare in some parts; *H. Auricula-Pilosella velutinum* = var. *tiltophyllum* N. P.; *H. Auricula-tardans*: *H. tardiusculum* N. P., valley of Entremont, Dôle in the Jura; *H. collinum-Pilosella*: *H. prussicum* N. P. (*repens* Willd.?), Heidelmoos near Constance, beyond our boundaries; *H. cruentum-Pilosella*: *H. Umbella* N. P. col de l'Albula; *H. cymosum-Pilosella*: *H. canum* N. P., Wilchingen, Canton Schaffh.!!; *H. florentinum-furcatum*: *H. furcellum* N. P., Zermatt (rather doubtful); *H. florentinum-glaciale*: *H. frigidarium* N. P., Simplon; *H. florentinum-Hoppeanum*: *H. arnoserioides* N. P., valley of Viège; *H. florentinum-Peleterianum*: *H. hybridum* Chaix nec alior., Zermatt, Nax; *H. florentinum-Pilosella*: a. *H. brachiatum* Bert. (*acutifolium* Griseb., *Hybridum* Gaud. p.) forma intermedia, stolonifera, here and there; b. *H. venetianum* N. P. (*aridum* Freyn) forma intermedia astolona, Zermatt, Orsières, Bex; c. *H. adriaticum* Näg. (*caricinum* Arv.-Touv. saltem p) forma accedens ad florentinum, with a taller stem than the two last, heads 7—30, arranged in a corymb, Sion; *H. florentinum-tardans*: *H. tephrodes* N. P., Sion; *H. furcatum-glaciale*: *H. permutatum* N. P., Eastern Alp.; *H. furcatum-Hoppeanum*: *H. eurylepium* N. P., Valserberg, Splügen; *H. furcatum-Pilosella*: *H. basifurcum* N. P., Eastern Alp.; *H. glaciale-Pilosella*: *H. glaciellum* N. P., Graub., Wall.; *H. glaciale-Pilosella velutinum*: *H. hypoleucum* Arv.-Touv., *H. velutellum* N. P.; *H. glaciale-Peleterianum*: *H. finalense* N. P., Zermatt; *H. glaciale-tardans*: *H. Faurei* Arv.-Touv. (*H. poliocephalum* N. P.), Simplon; *H. Hoppeanum-Pilosella*: *H. hypocyrium* N. P., eastern Alp.; *H. Peleterianum-Pilosella*: *H. pachylodes* N. P. Here perhaps II. *Pilosella velutinum* v. *macristolonum* from Eginenthal and Simplon; *H. Pilosella-Zizianum*; *H. albipedunculum* N. P., Sion, Lourtier, Wilchingen.—Intermediate forms composed of 3 species are: *H. aurantiacum-Auricula-furcatum*: *H. amaurocephalum* N. P., Avers; *H. Auricula-collinum-florentinum*: *H. floribundum* Wimm. Grab., Marbach*); *H. Auricula-furcatum-Hoppeanum*: *H. nigricarinum* N. P., Eastern Alp.; *H. cymosum sabinum-glaciale-Pilosella*: *H. trichodes* N. P., Col de Bernina.—The following forms still require further observation: *H. aurantiacum-sabinum*, B. S. M., St. Bernard; *H. furcatum-incanum* Lagg. in Grml. Beitr. 93, B. S. M. 37 Eginenthal; *H. glaciale- (Hoppeanum) piloselloides* (Beitr. 93, Christeneri, Grml.), Albula; *H. glaciale-sabinum* (*corymbulifolium* Arv.-Touv. p.), B. S. M. 37, St. Bernard; *H. Pilosella-sabinum* (*biflorum* Arv.-Touv.), B. S. M. 37, Reidigalp, Canton Bern.—With respect to the hybrids indicated by Brügger (see N. Beitr. III, 33) between the subgenus *Pilosella* and that of *Euhieracium*, as *H. glaciale-glanduliferum*, *H. glaucum-piloselloides*, *H. murorum-piloselloides*, they are absolutely false. See also Näg. and Pet. mon. 523.

OBS. II. Hybrids of the subgenus *Euhieracium*: *H. lanatum-pictum* (*lanatellum* Arv.-Touv. saltem p. Simplon! Riddes! Sion!); *H. ochroleucum-valdepiilosum* (Engadine according to Christener); *H. glaucum-villosum*? N. Beitr. I, 17); *H. piliferum-villosum*? (Torembece).

OBS. III. Among the cultivated pls of this family we may enumerate also: *Cynara Scolymus* L., artichoke, and *C. Cardunculus* L., cardoon.—Also: *Carthamus tinctorius* L.—*Cnicus benedictus* L.

59. Ambrosiaceæ.

359. Xanthium. Bur-weed. XXI, 29.

1. Spines at the base of the ls strong, yellow, 3-partite. Ls cuneiform at the base, with an elongated, acuminate middle lobe.—Rubbish heaps, hedges: introduced with wool from Hungary; observed near Geneva, Bern, Bâle and Schaffh. 7 . . . **spinosum* L. 1438.

*) *H. floribundum* is a collective species fairly distrib. in N. E. Europe; in Switzerland only the var. *succisum* Fr. is found, otherwise inhabiting the North almost exclusively. The pl. of Marbach then may well be an hybrid.

- Spines at the base of the ls 0. Ls cordate at the base, or, in the curve, prolonged to a corner at the petiole **2**
- 2. Fr.-envelopes 12—15 *mm* long, covered with slender prickles, straight and hooked at the top.—As the last; rather rare (wanting in G. U. L. A. S.). 7
strumarium L. 1439.
- Fr.-envelopes larger, covered with more numerous prickles, which are arched from the middle and rolled up in a circle at the top.—As the last; formerly indicated near Geneva. 7 * **macrocarpum Dec. 1440.**

60. Campanulaceæ.

360. *Jasione*. *Jasione*. V, 17.

- 1. Ls crisp-wavy at the edges.—Wood-sides, slopes; almost distrib. 6 **montana L. 1441.**

361. *Phyteuma*. *Rampion*. V, 17.

- 1. Inflorescence in globular or ovoid heads after flowering. (Fls blue or violet; stigs 3.) **2**
- Inflorescence in ovoid or oblong, finally almost cylindric, heads. (Bracts linear or linear-subulate.) **6**
- 2. Bracts linear, gen. much longer than the many-fl'd head. Stem slender. Lower ls with long petioles, cordate-oval or cordate-lanceolate.—Rocky places in the Alp. and subalp., descending into the valleys; G. T. W. O. 6
Scheuchzéri All. 1442.
- Bracts round-oval, oval, or oval-lanceolate, gen. shorter than the head **3**
- 3. Heads many-fl'd. Stem 30—50 *cm*. Ls dentate-crenate, the lower gen. cordate-lanceolate, the cauline oblong, elliptic-oblong or lanceolate. Varied v. *ellipticum* Thom. with rad. ls narrowed to the base, and numerous caul. ls only slightly reduced in size, and very long styles.—Pasturages and hills, especially in the mount. and subalp. 6 **orbiculare L. 1443.**
- Heads 5—12-fl'd. Stem 2—10 *cm* **4**
- 4. Bracts round-oval, rather obtuse. Ls obovate-lanceolate or (v. *globularifolium* Gaud. an Hopp.?) obovate, often with 3 notches at the top. Heads 5—7-fl'd. Stem 2—5 *cm*.—High Alp., G. T. W., Glarus. 7, 8 **pauciflorum L. 1444.**
- Outer bracts oval or oval-lanceolate, acute or acuminate. Ls linear or linear-lanceolate, entire or slightly crenate at the top. Heads 10—12-fl'd **5**
- 5. Bracts oval at the base, toothed with acute teeth, then narrowed-lanceolate, scarcely as long as the head, some-

- times, however, longer.—High Alp.; G. W. (Bernina-Heuthal, Zermatt). 7 . . . **humile Schleich.** 1445.
- Bracts oval-acuminate, entire, about half as long as the head. Varied v. *trychophyllum* Christ in. Ls grass-like only 1—1½ mm broad, as long or even longer than the stem (20 cm and more). Graub.—High Alp. 7 **hemisphæricum** L. 1446.
- 6 (1). Fls dirty white, greenish at the top, very rarely (v. *coeruleum*) bluish. Ls cordate-oval, gen. spotted with brown.—Woods; distrib. 6 . . . **spicatum** L. 1447.
- Fls blue or violet, more or less dark . . . 7
7. Fls light violet. Rad. ls cordate-lanceolate or lanceolate, or indeed linear, obtusely crenate. Type of *P. Michellii* Koch . . . 8
- Fls dark blue or blackish violet. Rad. ls cordate-oval, a third or half broader and the bracts longer than in the preceding group . . . 9
8. Ls glabr. or only ciliate, the rad. long, linear or linear-lanceolate, narrowed to the petiole. Styles gen. 2.—Varied: Bracts and calyxes glabr. (*scorzoneræfolium* Gaud. A. Dec.) or hairy (*Michellii* Gaud. A. Dec.)—Hills of southern Switz.; G. (Splügen: Gaud.); T. (Trans-Cenere); W. (Gerenthal!). 6 **scorzonerifolium** Vill. 1448.
- Ls glabr. or hairy, the rad. cordate-lanceolate or lanceolate, long petioled. Styles gen. 3.—Alp. and subalp., rarely lower. 7 . . . **betonicæfolium** Vill. 1449.
9. Ls almost simply crenate-dentate. Stas almost glabr. Heads shorter than in 1447; ls less deeply cordate, the caul. more cuneiform.—Vallée de Joux. 6 **nigrum** Schmidt. 1450.
- Ls coarsely and deeply double-toothed. Stas woolly.—Alp. and subalp. 7 . . . **Halleri** All. 1451.
- OBS. *Ph. Halleri-spicatum* (Schlatter).

362. Campanula. Campanula. V, 19.

1. Each sinus between the cal.-lobes with a reflexed appendage. Fls in a raceme, drooping, rarely erect (v. *strictopedunculata* Thom.), rarely 1-fl'd (v. *uniflora* A. Dec.). Alp. and subalp. 7 . . . **barbata** L. 1452.
- Sinus between cal.-lobes without appendages . . . 2
2. Fls peduncled, in raceme or panicle, rarely solitary 3
- Fls sessile or almost so, in terminal and lateral heads, or indeed in spikes . . . 17
3. Cal.-lobes narrow, linear or subulate . . . 4
- Cal.-lobes broader, lanceolate or oval-lanceolate . . . 10
4. Rad. ls (sometimes already withered at the time of flowering) broad, reniform or cordate-oval. Capsule drooping . . . 5

- Rad. ls oblong-obovate, narrowed to a petiole. Capsule erect **9**
- 5. Caul. ls numerous, oval or oval-lanceolate, with acute teeth; rad. ls gen. 0. Stem 20—50 *cm.*—Alp., subalp. and Jura. 6 **rhomboidalis L. 1453.**
- Caul. ls all or, at any rate, the upper, linear or linear-lanceolate, entire (in 1455 the lower ones broader, more distinctly toothed, but numerous) **6**
- 6. Cor.-lobes narrowed at the base and separated by a rounded sinus.—Granite Alps; T. W. (Furka di Bosco, Münsterthal, Binn, Simplon, Gamserthal, Saas). 7 **excisa Schleich. 1454.**
- Cor.-lobes not narrowed at the base **7**
- 7. Cor. campanulate—almost hemispheric, or short cylindric-campanulate, rather swollen. Pl. glabr. or hairy or entirely gray-hairy (v. *pubescens*), cœspitose, with numerous rosettes of ls, 8—15 *cm.* Inflorescence gen. a simple, few-fl'd raceme, rarely (v. *subramulosa Jord.*) slightly panicle. Lower caul. ls more numerous, broader and more strongly toothed than in 1456. Leaf-buds drooping. *C. gracilis Jord.*—Rocks, walls and gravel beds of torrents in the Alp., subalp. and Jura, descending to the plain. 6 **pusilla Hænk. 1455.**
- Cor. campanulate-infundibuliform. Pl. gen. glabr., not very cœspitose, with fewer rosettes, often partly withered even by the time of flowering. Stem 15—50 *cm.* Inflorescence a several- or many-fl'd panicle, in the smaller pls and on the mountains sometimes in a few-fl'd raceme, or with only 1 fl. **8**
- 8. Fls in a panicle, rarely a raceme, 15—20 *mm* long; l.-buds almost erect.—Varied: short gray-hairy (v. *velutina Dec., Wall.*) and taller, with long ls and numerous fls (v. *lancifolia Koch.*)—Grassy places, walls and rocks; everywhere. 5, 6 **rotundifolia L. 1456. *)**
- Fls in a raceme, 1—5, larger than in the last (30—40 *mm*); fl.-buds drooping or reflexed; cal.-lobes longer. Caul. ls often broader than in the last. *C. linifolia Hænke, Gaud. not Lam. **)*—Varied: Pl. glabr. or (v. *hirta = C. valdensis All.?*) hairy.—Alp., subalp. and Jura. 7 **Scheuchzéri Vill. 1457.**
- 9 (4). Panicle many-fl'd, long, pyramidal. Lateral peduncles with bracts near the base. Cal.-lobes linear-subulate.—Slopes, road- and field-sides; distrib. 5 **Rapunculus L. 1458.**

*) **C. confertifolia Reut.** and **C. pennina Reut.** are probably connected with this species.

) **C. linifolia Lam. with inflorescence in a narrow raceme, and buds almost erect, is indicated erroneously (by Nymann) as growing in Switzerland. This species is found in Piémont, Dauphiné and Provence.

- Panicle (rarely raceme) lax corymb-shaped. Lateral peduncles with bracts above the middle. Cal.-lobes lanceolate-subulate.—Meadows, wood-sides; fairly distrib.; but not everywhere. 5 **pátula** L. 1459.
- 10 (3). Stem 1-fl'd (rarely 2—3-fl'd), 5—10 *cm* high. (Alpine pls) **11**
- Stem 3—many-fl'd (rarely in 1462 2- or 1-fl'd), 30—90 *cm* high **12**
- 11. Cor. infundibuliform, 5-fl'd to below the middle, 12—15 *mm* long. Ls entire, obovate, obtuse, gen. ciliate.—High Alp.; not common. 7 **cenisia** L. 1460.
- Cor. swollen-campanulate, 5-fl'd to a third of its length, 25—30 *mm* long. Ls crenate, the lower spathulate, narrowed to distinct petioles.—T. (M. Generoso). 7
Rainéri Perp. 1461.
- 12. Rad. ls oblong-obovate, narrowed to a petiole, the caul. narrow, linear or linear-lanceolate. Caps. erect . . . **13**
- Rad. ls gen. with long petioles and cordate at the base, or at any rate the caul. broad oval-lanceolate. Caps. drooping **14**
- 13. Stem gen. bearing 3—6 (rarely —15) ls Cor. large (30 to 35 *mm*), hemispheric-campanulate, as broad or almost as broad as long.—Wooded hills; fairly distrib. (wanting in U. A.). 6 **persicifolia** L. 1462.
- Stem terminated by a several—many-fl'd corymb. Cor. smaller, infundibuliform-campanulate, longer than it is broad **9**
- 14. Fls rather small, almost sessile in the axils of the bracts, arranged in a long spiciform raceme. Cor.-lobes glabr. Ls gray-tomentose underneath.—Thickets; T. W. 7
bononiensis L. 1463.
- Fls of medium size or large, the lower ones, at any rate, in the axils of the ls (sometimes small). Cor.-lobes gen. ciliate **15**
- 15. Rt-stock with subterranean stolons. Cal.-lobes lanceolate, reflexed after flowering. Cor. 20—28 *mm* long.—Fields, road-sides; distrib. 7 **rapunculoides** L. 1464.
- Rt-stock without stolons. Cal.-lobes oval-lanceolate, erect or slightly spreading **16**
- 16. Stem angular with acute angles. Ls rough-scabrous, the lower cordate-oval. Cor. large (35—40 *mm*).—b. *urticifolia* Gaud. Caul. ls narrower, stem with acuter angles, branchy.—Woods: everywhere. 7 **Trachélium** L. 1465.
- Stem angular with obtuse angles. Ls with short hair, the lower oval-oblong, scarcely cordate. Cor. very large (40—45 *mm*).—Mountain woods; rather rare (wanting in T. O. L. Z. S.). 6 **latifolia** L. 1466.

366. *Oxycoccus*. *Cranberry*. VIII, 8.

1. Stem creeping, with filiform branches. Ls small, ashy-gray underneath. Fls rose-coloured. *Vaccinium Oxycoccus* L. — Peat bogs; distrib. (only wanting in S.) 6
palustris Pers. 1477.

62. *Ericaceæ*.367. *Arctostáphylos*. *Bear-berry*. X, 4.

1. Ls thick, leathery, entire (net-veined, neither spotted nor rolled up, which easily distinguishes this pl. from No. 1474). Berries red.—Stony places of Alp., subalp. and Jura. 4, 5 . . . *uva Ursi* Sprgl. 1478.
- Ls thin, the lower ones dry, finely toothed. Berries black.—Alp. and Jura (Reculet). 5 *alpina* Sprgl. 1479.

368. *Andrómeda*. *Andrómeda*. X, 5.

1. Ls linear-lanceolate, rolled at the edges, glaucous underneath.—Peat-mosses; (wanting in T. W. S.). 5
polifolia L. 1480.

369. *Calluna*. *Ling*. VIII, 7.

1. Small shrubs. Ls acicular, very short. Fls rose-coloured, rarely white. Stas with anthers dorsally fixed.—Heaths, woods; everywhere. 7, 8 . . . *vulgaris* Salisb. 1481.

370. *Erica*. *Heath*. VIII, 7.

1. Small shrubs. Ls acicular. Fls red. Anthers not dorsally fixed.—Alp. and subalp., sometimes descending to the valleys. 5 (3) . . . *cárnea* L. 1482.

371. *Azálea*. *Azalea*. V, 47.

1. Small shrubs. Ls small, persistent, oval, rolled at the edges. Fls rose-coloured. *Loisleuria* proc. Desv.—High Alp. 7 . . . *procumbens* L. 1483.

372. *Rhododéndron*. *Alpine-rose*. X, 5.

1. Ls ciliate at the edges, green underneath and spotted with scattered resinous glands. Cal.-lobes oblong-lanceolate, longer than broad.—Alp. and subalp., sometimes descending; not on granite, and not in the Jura! 6
hirsutum L. 1484.
 - Ls not ciliate, rolled at the edges, of a rusty brown colour underneath on account of the extremely crowded resinous glands. Cal.-lobes short-oval, broader than long.—Alp., subalp. and southern Jura, sometimes descending. 6 . . . *ferrugineum* L. 1485.
- OBS. Hybrid: *R. ferrugineum-hirsutum* (intermedium Tausch.).

63. Pyrolaceæ.

373. *Pyrola*. Wintergreen. X, 7.

1. Stem 1-fl'd.—Mossy woods, especially of the mount. and subalp., but not common. 6 . . . *uniflora* L. 1486.
- Fls in an umbel.—Pine woods; Andelfingen! 6
umbellata L. 1487.
- Fls in a raceme 2
2. Raceme unilateral. Ls oval-acute, crenate-dentate.—Woods; distrib. 6 *secunda* L. 1488.
- Fls of the raceme turning to all sides 3
3. Stas arched-ascending; style reflexed 4
- Stas connivent; style straight, vertical or oblique 5
4. Cal.-lobes lanceolate-acuminate, much longer than broad, half as long as the white cor. Raceme many-fl'd (10 to 20 fls).—*b. arenaria* Scheele. Pl. smaller; cal.-lobes broader, rather obtuse.—Woods; distrib.; *b. Bagnethal*. 6
rotundifolia L. 1489.
- Cal.-lobes oval-triangular, almost as broad as long, a quarter the length of the cor. which is greenish white. Raceme few-fl'd (3—7).—As the last but rarer. 6
chlorantha Sw. 1490.
5. Cal.-lobes oval-lanceolate. Style longer than the ovary, oblique, thickened above in a ring which is as broad or broader than the stig. *P. minor-rotundifolia*??—Woods; rare; G. B. O. U. A. (Always the true species?) 6
media Sw. 1491.
- Cal.-lobes triangular-oval. Style shorter than the ovary, vertical, not thickened at the top; stig. twice as broad as the style.—Woods; distrib. 6 *minor* L. 1492.

64. Monotropaceæ.

374. *Monotropa*. Monotrope. VIII, 10. X, 6.

1. Pets and stas hairy. Ovary oblong.—Woods; distrib. 7
Hypopitys L. 1493.
- Pets and stas glabr. Ovary ovoid. Otherwise as in the last, with which it is gen. confused. 7 *glabra* Bernh. 1494.

65. Ebenaceæ.

375. *Diospyrus*. *Diospyrus*. VIII, 6.

1. Ls oval-oblong, acuminate, entire or denticulate. Fls solitary in the l.-axils, almost sessile.—Rocky places; Lugano. 5
Lotus L. 1495.

66. Aquifoliaceæ.

376. *Ilex*. Holly. IV, 6.

1. Ls persistent, with thorny teeth and wavy edges, on old trees entire.—Woods; distrib. 5 *Aquifolium* L. 1496.

67. Oleaceæ.

377. *Olea*. Olive. II, 4.

1. Ls lanceolate, persistent, whitish-gray underneath. Fls white, in racemes.—Tess., where it was formerly cultivated. 5, 6 † *europæa* L. 1497.

378. *Ligustrum*. Privet. II, 4.

1. Ls oblong-lanceolate. Fls white, in dense panicles.—Thickets and hedges; everywhere. 6 *vulgare* L. 1498.

379. *Syringa*. Lilac. II, 4.

1. Ls oval, acuminate, with feebly cordate base. Fls lilac, violet or white, in pyramidal panicles.—Everywhere in shrubberies and gardens, rarely wild. 4 *vulgaris* L. 1499.

OBS. *S. persica* L. and *S. chinensis* Willd. (*persica-vulgaris*) are also cultivated in shrubberies.

380. *Fráxinus*. Ash. II, 2. XXII, 6.

1. Leaflets 9—15. Fls appearing before the ls. Cal. and cor. 0.—Damp woods; distrib. 4 . *excelsior* L. 1500.
- Leaflets 7—9. Fls appearing with the ls. Cal. and cor. present. *Ornus europæa* Pers.—Woods; Tess. 4 *Ornus* L. 1501.

68. Jasminaceæ.

381. *Jasminum*. Jasmin. II, 3.

1. Ls opp., pinnate. Fls white, scented.—East Indies; cultivated in shrubberies and to ornament walls, almost subsontaneous in the warm parts of transalpine Switz. 6 *officinale* L. 1502.

69. Asclepiadeæ.

382. *Vincetóxicum*. *Vincetóxicum*. V, 124. XVI, 4.

1. Ls opp., entire, shortly petioled. Fls dirty white or yellowish, in umbel-shaped cymes, petioled. Döll. distinguishes: a. *V. offic.* Corona low, with very distant

lobes; and b. *V. laxum* *Bartl.* Corona higher with crowded lobes; stem taller, often rather twisted at last. This last form is indicated in the calc. Alps of Switz.—Stony, thickety places; distrib. 6 **officinale** *Mönch.* 1503.

70. Apocynaceæ.

383. *Vinca*. Periwinkle. V, 46.

1. Ls elliptic, acute at both ends, or obtuse at the base. Cal.-lobes glabr.—Wooded and thickety places; distrib. 4 **minor** *L.* 1504.
- Ls oval, narrowed towards the top, rounded or almost cordate at the base. Cal.-lobes ciliate.—As the last; eastern and southern Switz., probably only escaped from gardens. 4, 5 **major** *L.* 1505.

71. Gentianaceæ.

384. *Menyanthes*. Buck- or Bog-bean. V, 35.

1. Rad. ls ternate. Fls white, reddish outside.—Marshes; distrib. 4, 5 **trifoliata** *L.* 1506.

385. *Chlora*. Yellow-wort. VIII, 5, 21.

1. Caul. ls (glabr. and glaucous) triangular-oval, united by the whole width of their bases. Cal.-lobes subulate, shorter than the yellow cor.—Waste and rather damp places; scattered (wanting in G. S.). 6 **perfoliata** *L.* 1507.
- Caul. ls oval or oval-lanceolate, rounded at the base, not united by the whole width of their bases. Cal.-lobes lanceolate-subulate, about the length of the cor. which is of a paler yellow. Stem lower than in the last.—As the last, rare; W. V. Z. 6, 7 . . . **serotina** *Koch.* 1508.

386. *Sweertia*. *Sweertia*. V, 125.

1. Peduncles quadrangular, almost winged. Cor. dirty violet, rarely whitish.—Marshy places of the mount. and subalp. (wanting in T. Z. S.). 7 . . . **perennis** *L.* 1509.

387. *Pleurogyne*. *Pleurogyne*. V, 126.

1. Stem 2—4 *cm.* Peduncles elongated. Fls variegated blue and white.—Alp.: Graub. (Val Avers); Wall. (Saas, Zermatt); Glarus (Kistengrat). 7 **carinthiaca** *Griseb.* 1510.

388. *Gentiána*. *Gentian*. V, 48, 126. IV, 21. VI, 6.

1. Fls yellow or red 2
- Fls blue or violet, rarely white 5

2. Cor. div. almost to the base. Fls yellow.—Mount. and subalp. 7. *lutea* L. 1511.
- Cor. only lobed to $\frac{1}{3}$ or $\frac{1}{4}$ its length 3
3. Cal. cleft almost to the base of one side only, in the form of a spathe. Cor. reddish outside, yellowish inside, rarely yellow (v. *flavida*), very rarely white.—Alp. and subalp. 7 *purpurea* L. 1512.
- Cal. campanulate, with almost equal teeth 4
4. Cal.-lobes erect. Cor. yellow, spotted with red-brown, rarely (v. *concolor*) without spots.—As the last but rarer. 7 *punctata* L. 1513.
- Cal.-lobes reflexed Cor. dark red, spotted with black. —Alp.; on the northern side of the Churfirsten! 7 *pannonica* Scop. 1514.
- 5 (1). Throat of the cor. fringed with multifid scales 6
- Throat of the cor. not fringed 10
6. Cor. 4-partite almost to the base. Stem 2—5 cm, branched almost from the base, with long, gen. 1-fld, branches. *G. glacialis* Thom.—High Alp.; not common. 7 *tenella* Rottb. 1515.
- Cor. cleft to, at most, $\frac{2}{3}$ its length. Stems 15—30 cm, except in dwarf pls 7
7. Cal. almost always 4-partite; the two outer lobes 3 to 4 times as broad as the others, like bracts. Cor.-lobes gen. more obtuse than in *G. germanica*.—Alp., subalp. and Jura, also lower. 7 *campestris* L. 1516.*)
- Cal. 5-fld to the middle (rarely 4-fld); lobes fairly equal, rarely in *G. germanica* the 2 outer broader 8
8. Ls lanceolate or linear-lanceolate. Fls narrower and smaller than in *G. germanica*. Ovary hardly contracted at the base (sessile).—Lower Engadine; Uechtriz; the true species? * *Amarella* L. 1517.
- Ls broader, oval-lanceolate or oblong. Fls fairly large. Ovary much contracted at the base (appearing stipitate) 9
9. Caul. ls, except the lowest which are gen. withered, with broad bases, oval-lanceolate, acute or acuminate.—Pasturages, wood-edges; distrib. 8 *germanica* Willd. 1518.
- Caul. ls, except those at the top, spatulate or oblong-oval, obtuse. Varied: with sulphur yellow fls (v. *flava* Lois?). —Alp., especially on granite, by preference in the eastern Alp.; also in the Bodenseeried near Rheineck. 7, 8, in the low lands earlier than *G. germanica* *obtusifolia* Willd. 1519.

*) *G. chloræfolia* Nees (*campestris-germanica* Griseb. *obtusifolia* Gren. jur.?) with 5 cal.-divisions, and broader ls, indicated at Salève.—Intermediate forms between *G. campestris* and *obtusifolia* are found, according to Nägeli, on the Piz Padella in the Upper Engadine.

- 10 (5). Cor.-lobes with long fringes on the lower edges, without intermediate teeth. Cor. 4-partite.—Pasturages, wood-edges; distrib. 8 **ciliata L. 1520.**
- Cor.-lobes not fringed, but between the lobes there is often a fold terminated by an acute or 2-fid appendage **11**
11. Fls clustered in whorls in the axils of the upper ls and at the top of the stem.—Pasturages, wood-edges; distrib. 7, 8 **cruciata L. 1521.**
- Fls either solitary or 2 together in the axils of the upper ls, or in pairs at the top of the stem, or in racemes or panicles on a branchy stem **12**
12. Cor. campanulate-club-shaped, enlarged above . . . **13**
- Cor. with a rotate limb and cylindric tube, almost of the same thickness in every part. Stem 2—10 cm **16**
13. Stem 15—75 cm, gen. several- or many-fld (also, in dwarf pls, few- or 1-fld). Rad. ls 0 **14**
- Stem 2—5 cm, always 1-fld; fl. very large. Rad. ls in a rosette. Type of *G. acaulis* **15**
14. Ls oval-lanceolate, long-acuminate.—Woods and marshes; especially of the mount. and subalp., distrib., more common in eastern Switz.. but very rare in the Jura (Passwang, Vogelberg). 7, 8 . . . **asclepiadéa L. 1522.*)**
- Ls linear or linear-lanceolate, rather obtuse, the lower scale-shaped.—Marshy meadows; scattered. 6
Pneumonanthe L. 1523.
15. Ls rather leathery, lanceolate or elliptic-lanceolate, acute or acuminate, the edges of the upper cauline slightly rough when seen through a lens. Cal.-lobes with broad bases, narrowed-lanceolate, erect. Sinus between the cal.-lobes gen. sharp. *G. Clusii* Perr. Song.—Alp., subalp. and Jura. 6 **acaulis auct. 1524.**
- Ls softer and broader than in the last, elliptic or elliptic-lanceolate, rather obtuse or short-acute, edges of the upper caul. smooth. Cal.-lobes with rather narrower base, contracted, oval-lanceolate rather separated from the cor. Sinus between the cal.-lobes truncate, the membrane connecting the divisions of the cal. more developed than in the last. Throat of the cor. touched with green. *G. Kochiana* Perr. Song.—b. *alpina* Vill. Smaller form of the high Alps with scarcely any stem. (Fully, Camoghé.)—Alp. and Jura (*e. g.* Chasseron); 6, sometimes with the last and then rather earlier
excisa Presl. 1525.)**

*) Varied according to Zollikofer: Ls crossed, fls more dense; and ls distichous, fls more distant.

**) The true *G. angustifolia* Vill. (*sabauda* Boiss. Reut.?) on the limestone mountains of Savoy, also indicated in Wall., is very nearly allied, but differs in the longer, narrower, and very shiny ls.

- OBS. Hybrids: *G. lutea-punctata* (Charpentieri Thom.); *G. lutea-purpurea* (Thomasii Gill., rubra Clairv.); *G. punctata-purpurea* (spuria Leb., Gaudiniana Thom.).

1. Lower ls in a rosette. Stem 15—30 *cm*, branchy only in the upper part. Fls fascicled, forming a corymb.—Wood clearings; everywhere. 7 . . . **Centaurium Pers. 1531.**
— Lower ls not in a rosette. Stem 3—15 *cm*, gen. very branchy from the base, or at least from the middle, forming a lax corymb with distant fls. Dwarf pls have sometimes a simple, 1-fl'd stem.—Damp pasturages, ditches, road-sides; distrib. 6 . . . **pulchella L. 1532.**

1. Ls imparipinnate; leaflets numerous, lanceolate, entire. Fls blue, rarely white. *P. rhæticum* Thom. (Leaflets more distinctly nerved underneath).—Wooded places; damp meadows; G. W. V. Jura of Neuchâtel and Bern; also cultivated as an ornamental pl. 5. **coerûleum** L. 1533

73. Convolvulaceæ.

391. *Convolvulus*. Bind-weed. V, 49.

1. Bracts large, oval or cordate-oval, near to the fl. and, more or less, surrounding the cal. Fls large, white.—Fields, hedges; everywhere. 6 . . . *sépium* L. 1534.
- Bracts small, linear, removed from the fls. Fls smaller, rose or white.—Fields, vineyards, way-sides; everywhere. 6
arvensis L. 1535.

392. *Cuscuta*. Dodder. V, 123. IV, 9.

1. Fls peduncled, fascicled. Stig. globular-capitate. Grammicaramosa Lour. — Lucern-fields, introduced with foreign grain; observed near Bellinzona and Geneva. 8
**racemosa* Mart. 1536.
- Fls sessile, in globular heads. Stig. filiform or club-shaped 2
2. Cor.-tube globular-swollen, twice as long as the limb. Stem simple or not much branched, pale.—On flax and the weeds which grow among it; not common (wanting in T. U. A.). 6 *Epilinum* Weih. 1537.
- Cor.-tube at first cylindric, as long as, or shorter than, the limb. Stem branchy 3
3. Fls gen. 4-merous. Scales (in the cor.-tube) small. Style shorter than the ovary.—b. *Viciæ Schönk.* Anthers as long as the filament which is dilated at the base (God.). —On *Urtica dioica*, *Humulus* and the *salixes* &c, distrib. 6 *europæa* L. 1538.
- Fls 5-merous. Scales large. Style longer than the ovary. Stem slenderer than in the last.—b. *Trifolii Babgt.* Fls larger, paler.—On thyme and other small pls; b. on clover and lucern. 6 *Epithymum* Murr. 1539.

OBS. *C. approximata* Babgt. and *C. Cesatiana* Bert. (polygonorum De Not. not Engelm.) are indicated in Tess.

74. Boragineæ.

393. *Heliotrópium*. Heliotrope. V, 21.

1. Fls small, bluish or white, in dense spikes, rolled up, without bracts.—Fields, rubbish-heaps; eastern Switz. and Tess. 7 *europæum* L. 1540.

394. *Asperúgo*. *Asperúgo*. V, 24.

1. Fls small, blue, 1 or 2 together in the axils of the ls. Stem clinging to objects by small prickles which are turned downwards.—Rubbish-heaps, in the neighbourhood of dwellings; eastern Switz., otherwise here and there, changeable. 5 *procumbens* L. 1541.

395. *Echinospermum*. *Echinospermum*. V, 26.

1. Fr.-peduncles erect. Stem branchy above (rarely from the base).—Waste ground, walls; not everywhere (wanting in L. S.). 7 *Láppula* Lehm. 1542.
- Fr.-peduncles reflexed. Stem branching from the middle or still lower.—Shady gorges of the granite Alp.; G. W. O. Glarus. 7 *deflexum* Lehm. 1543.

396. *Cynoglossum*. *Hound's-Tongue*. V, 26.

1. Ls thin, green, with scattered hairs, almost glabr. above, shining. *C. montanum* Lam.—Mountain woods; not common (wanting in T. U. L. Z. S.). 6 *germanicum* Jacq. 1544.
- Ls thicker, grayish, covered with a fine silky felt.—Stony waste places: distrib. 6 *officinale* L. 1545.

397. *Eritrichium*. *Eritrichium*. V, 29.

1. Fls blue, in few-fl'd racemes. Pl. 2—3 *cm*, cæspitose, villous-silken. Carpels edged by a ciliate-dentate wing, or (v. *Hacquetii* Koch) with 1 or 2 teeth on each side, or without teeth.—High Alp.; G. T. W. O. U. 7
nanum Schrad. 1546.

398. *Myosótis*. *Forget-me-not*. V, 29.

1. Cal. (and gen. the stem) covered with applied hairs 2
- Cal. (and stem) covered with spreading hairs, those of the base of the cal. hooked 3
2. Cal. div. to about a third of its length into 5 teeth; teeth triangular. Stem angular. Racemes without bracts. Fls varying in size.—b. *strigulosa* Richb. Racemes longer in proportion, but fr.-pedicels shorter; fls smaller; stem slenderer.—c. *cæspiticia* Dec. (*Rehsteineri* Wartm.) Racemes shorter; fls large; stem not tall (3—5 *cm*), cæspitose; flowering early.—Damp meadows, ditches; everywhere; b. on turf-soil; c. on land periodically inundated near the lakes of Constance, Neuchâtel and Geneva; the banks of the Rhine. 5 *palustris* Roth. 1547.
- Cal. 5-fl'd to the middle; lobes oblong (rather contracted at the base). Stem cylindric (shining). Racemes often leafy at the base, gen. long, lax. Fls always small.—Inundated places, muddy ditches; rarer than the last (wanting in U.). 6 *cæspitosa* Schultz. 1548.
3. Cor.-limb always flat, 6—10 *mm* in diameter 4
- Cor.-limb gen. concave, 3—4 *mm* in diameter 5
4. Fr.-pedicels 1½—2 times as long as the cal.; cal. covered with abundant hooked hairs. Like *M. intermedia*, but fls about as large as those of *M. palustris*, the cal.-teeth are shorter or as long (in *M. intermedia* distinctly longer)

- as the cor-tube.—Meadows, road- and wood-edges; distrib. but wanting in some parts. 4, 5 **sylvatica Hoffm.** 1549.
- Fr-pedicels thicker than in the last, hardly longer than the cal.; cal. covered with numerous applied, but few spreading and hooked, hairs; the fr.-calix narrower at the base than in the last; the stem lower.—Alp., subalp. and Jura. 6, 7 . . . **alpestris Schmidt.** 1550.
5. Racemes leafy below, and gen. commencing near the base of the pl. Fr-pedicels almost erect, distinctly shorter than the cal. which is closed at maturity Ls covered underneath with hooked hairs.—Hills, sandy fields; Simplon, Zermatt, Sion, Branson, Bern, Bâle, Bremgarten, Diessenhofen. 4 . . . **stricta Link.** 1551.
- Racemes leafless. Fr-pedicels almost horizontal, or at least erect-spreading . . . **6**
6. Cor. yellow, then rose and blue. Cor-tube, during its entire development, almost twice as long as the cal. Fr-pedicels shorter than the cal.; cal. longer than in 1554. Stem not very firm.—Fields, grassy places, especially on silicious earth; not everywhere (wanting in G. U. A.). 5 . . . **versicolor Rchb.** 1552.
- Cor. blue; cor-tube enclosed in the cal. . . . **7**
7. Fr-pedicels longer, as much as twice as long as the cal.; cal. closed when mature by the connivent cal.-lobes. Racemes, also during their entire development, gen. shorter than the non-branching part of the stem, which is fairly strong.—Fields, slopes, road-sides; everywhere. 4—10 **intermedia Link.** 1553.
- Fr-pedicels as long as, or shorter than, the cal.; cal. open when mature. Racemes longer, during their whole development, than the non-branching part of the stem, which is slender. Fls smaller than in the last.—Grassy places, slopes; gen. rarer than the last (wanting in T. L.). 5 . . . **hispida Schlecht.** 1554.

399. *Lithospermum*. *Lithosperm.* V, 33.

1. Fls fairly large (12—15 mm in diam.), rather violet, then azure (like those of *Pulmonaria*!).—Mountain woods, here and there (wanting in G. U. L. A.). 5 **purpureo-coeruleum L.** 1555.
- Fls small, white or yellowish, very rarely light blue **2**
2. Stem with close-set ls. Fls greenish or whitish yellow. Carpels smooth, shining, white or bluish gray.—Gravelly, wooded places; distrib. 6 . . . **officinale L.** 1556.
- Stem with distant ls. Fls white, the tube often having a violet ring, very rarely light blue (*L. medium* Cheval.?). Carpels rough, dull brown.—Fields and road-side hillocks; everywhere. 4 . . . **arvense L.** 1557.

400. **Onósma. Onósma.** V, 33.

1. The bristles on the ls springing from a tubercle covered with small hairs arranged in the form of a star. *O. stellulatum* Grml not W. K., *O. montanum* Gaud. not S. S.—Hills; lower Rhone-valley. 6
helveticum Boiss. 1558.
 - The bristles on the ls springing from naked tubercles. Pl. less gray than the last, with hairs spreading more. *O. echioides* Gaud. not L., *O. arenarium* Rchb. not W. K.—As the last; between Aigle and Ollon, and between Bramois and Nax. 6
vaudense Grml. 1559.
- OBS. The two species are very closely allied to, and perhaps only varieties of, *O. arenarium* L. See N. Beitr. III, 22.

401. **Echium. Echium.** V, 31.

1. Fl.-branches gen. simple. Fls rose, then blue, rarely carnation or white.—Waste, gravelly places, road-sides; everywhere. 5
vulgare L. 1560.
- Fl.-branches 2-fid. Fls smaller, white or light red.—As the last; W. (again found, it is said, near Branson). 5
italicum L. 1561.

402—3. **Borago. Borage.** V, 23.

1. Fls large, azure blue, less often white. Anthers blackish. Pl. rough with stiff hairs.—Rubbish-heaps and gardens; naturalised. 5
officinalis L. 1562.

404. **Anchusa. Alkanet.** V, 28.

1. Cor.-tube jointed at the middle. Fls blue. *Lycopsis arvensis* L.—Fields (wanting in U. A.). 6
arvensis Bieb. 1563.
- Cor.-tube straight 2
2. Scales of the throat oval, velvety with very short hairs. Fls gen. of a purple-blue. *A. angustifolia* Gaud., *leptophylla* Koch?—Waste ground, road-sides; by preference in eastern Switz. G. T. V. (Yvorne) Z. S. A. and sometimes adventitious in other places. 6
officinalis L. 1564.
- Scales of the throat oblong, with a tuft of hairs almost 2 mm long at the top. Fls azure blue.—As the last; T. W. V. 5
italica Retz. 1565.

405. **Symphytum. Comfrey.** V, 27.

1. Stem branchy, 45—80 cm long. Upper ls entirely decurrent. Fls dirty white or (v. *patens* Sibth.) of a, more or less, dark violet.—Damp meadows, ditches: distrib. 5
officinale L. 1566.
- Stem simple or 2-fid, 20—30 cm. Upper ls half- or not decurrent 2

2. Scales of the throat prominent. Anthers as long as their filaments. Rt-stock creeping, slender, but swollen out here and there into globular tubercles.—Baumgarten, Locarno. 4 **bulbosum Schimp. 1567.**
- Scales of the throat enclosed. Anthers twice as long as their filaments. Rt-stock oblique, fleshy-tuberulose.—Wood-sides, hedges; Tess. (especially Trans-Cenere), Freibg. (Montbovon). 4 **tuberosum L. 1568.**

406. *Pulmonária*. Lungwort. V, 32.

1. Summer ls (full-grown ls of the lateral flowerless shoots) oval or oval-acuminate, rounded or slightly cordate at the base, suddenly contracted to a petiole, with stiff hairs and, at the same time fine, small, very short, prickles above. Type of *P. officinalis* **2**
- Summer ls (not spotted) lanceolate or oblong-lanceolate, narrowed insensibly to the petiole, with no small prickles above. **3**
2. Ls spotted with white, cordate-oval, acute, about $1\frac{1}{2}$ times as long as broad; petiole gen. rather shorter than the leaf. *P. officinalis* v. *foliis maculatis* Gaud.—Hedges, thickets; not everywhere; Tess., Bex, Aigle. 4
officinalis L. 1569.
- Ls not spotted, or rarely spotted with light green, cordate-oblong, acuminate, twice as long as broad; petiole longer than the ls. Fls almost only $\frac{1}{3}$ as large as in the last. *P. officinalis* auct. plur.—As the last; probably distrib. 4 **obscura Dumort. 1570.**
3. Fls azure blue. Cor.-tube glabr. inside below the ring of hairs. Ls narrower than in the other species. *P. angustifolia* L. p. nec Bess. neque Koch.—Alp.; Engadine (St. Moritz, Bevers, Samaden), Mt. Generoso. 6
azúrea Bess. 1571.
- Fls violet. Cor.-tube hairy inside below the ring of hairs **4**
4. Ls rough to the touch. Branches of the inflorescence very bristly and rough. *P. angustifolia* Koch p. —Thickets and woods of eastern Switz. (Bex, Geneva, Orbe, Neuchâtel, Freibg. and probably in other places, but confounded with the following). 4
tuberosa Schrank. 1572.
- Ls soft at the touch and glistening. Branches of the inflorescence covered with very numerous stipitate glands, rather viscous. *P. mollis* Wolff (1815). Koch.—As the last; Sion, Vévey, Freib., Bern. 4
montana Lej. (1811). 1573.

OBS. To investigate: *P. oblongata* Schrad. = *P. montana tuberosa*. See N. Beitr. I, 18.

407. *Cerithe*. *Cerithe*. V, 30.

1. Anthers as long as their filaments. Ls ciliate. *C. aspera* Roth.—Sion; Wolf (1872 and 1873). 6 *major L. 1574.
- Anthers 4 times as long as their filaments. Ls not ciliate. *C. glabra* Gaud. not Mill.—Alp. and Jura. 6
alpina Kit. 1575.

75. Solanaceæ.

408. *Lycium*. *Lycium*. V, 34.

1. Cor.-tube almost as long as the limb. Berries oblong. Branches pendant, spiny. Cal. bilabiate (*L. vulgare* Dun.) or almost 5-toothed (*L. sinense* Lam.).—Hedges, spontaneous. 6, 7 † *barbarum* L. 1576.
- Cor.-tube almost twice as long as the limb. Berries almost globular. Branches stiff, very spiny. *L. mediterraneum* Dun.—Southern Europe; rarely cultivated. 6
† *europæum* L. 1577.

409. *Solanum*. *Solanum*. V, 34, 55.

1. Ls interrupted-imparipinnate. Potato.—Cultivated everywhere. 6 † *tuberosum* L. 1578.
- Ls undiv. or (in 1579) the upper auricled-ternate 2
2. Perenn. pls. Principal stem woody, branches herbaceous, climbing or prostrate. Fls violet, rarely white. Berries oblong, red. Bitter-sweet.—b. *litorale* Raab. Stem and ls with a short tomentum.—Damp thickets, shores; distrib.; b. V. 6 *Dulcamara* L. 1579.
- Ann. pl. Stem herbaceous. Fls white, rarely tinted with violet. Berries globular. Type of *S. nigrum* 3
3. Pl. without much smell, with more or less scattered, stiff, hooked or applied hairs, which, on the (often almost winged) angles of the stem and branches, spring from small tubercles. Berries black when ripe, rarely (b. *chlorocarpum* Spenn.) green or (c. *humile* Mill.) greenish yellow, or red (d. *rubrum* Mill.).—Rubbish-heaps, road-sides, gardens; distrib.; b. c. d. in the Cantons of Wall., Vaud, and Geneva. 6 *nigrum* L. 1580..
- Pl. with a scent of musk, hairy, almost gray-tomentoser Berries greenish yellow or (b. *miniaturum* Bernh.) orange - o minium-red.—As the last; T. V. 6 *villosum* Lam. 1581. *)

OBS. *S. Lycopersicum* Tournef. (*Lycopersicum esculentum* Mill.), tomato has large scarlet fr. like a furrowed apple, and is gen. cultivated; also *S. Melongena* L.

*) According to others it is necessary to distinguish: 1. *S. alatum* Mönch (*miniaturum* Bernh.). Branches with angles prominent, almost winged and with stronger haired tubercles; fr. always red.—2. *S. villosum* Lam Branches with obtuse angles; pl more hairy, almost villous-tomentose; fr. orange-coloured; but, it is said also greenish and indeed black. The two species have a scent of musk.

410. **Nicandra. Nicandra.** V, 56.

1. Ls oval or elliptic, sinuate-dentate. Fls solitary, fairly large, light blue, white below.—Sometimes subspontaneous on rubbish-heaps and in gardens. 7
***physaloides** Gärtn. 1582.

411. **Physalis. Physalis.** V, 56.

1. Ls oval, almost entire. Fls solitary, dirty white. Berry like a scarlet cherry enclosed in the, at last, enlarged, minium coloured calyx.—Stony, thickety places, hedges; distrib. 6 **Alkekengi** L. 1583.

412. **Atropa. Atropa.** V, 54.

1. Ls oval, entire. Fls gen. solitary, reddish brown. Berry the size of a cherry, black, shining.—Woods, especially where recent clearings have been made; distrib. 6
Belladonna L. 1584.

413. **Hyoscyamus. Henbane.** V, 53.

1. Ls gen. sinuate-pinnatifid, the upper half clasping. Fls almost sessile in a 1-sided spike, dirty yellow, net-veined with violet. The ann., weakly, pl.: *H. agrestis* Kit.; the same with fls completely yellow: *H. pallidus* Kit.—Waste places and gardens, especially in warm parts. 5 **niger** L. 1585.

414. **Datura. Datura.** V, 52.

1. Ls oval, sinuate-dentate. Fls very large, white, rarely (b. *Tatula* L.) light violet. Fr. like that of the horse-chestnut.—As the last; b. Rorschach, Lausanne, Aigle; 6, 7
Stramonium L. 1586.

415. **Nicotiana. Tobacco.** V, 53.

1. Cor. greenish yellow, with a flat limb; lobes very short, obtuse or short-acuminate.—7 † **rustica** L. 1587.
- Cor. rose-coloured, infundibuliform; lobes acuminate 2
2. Ls oblong-lanceolate, acuminate; lateral nerves forming an acute angle with the middle one. 7 † **Tabacum** L. 1588.
- Ls broad elliptic or oval, acute or short-acuminate; lateral nerves forming almost a right angle with the middle one.—7 † **latissima** Mill. 1589.

76. **Scrophulariaceæ.**416. **Verbascum. Mullein.** V, 50.

1. Inflorescence with glandiferous hairs. Fls solitary, more rarely in pairs, forming a lax racème. Filaments

- of the stas covered with violet hairs.—Road-sides, shores, (wanting in W.? U. L. A.). 6 . . . **Blattaria L. 1590.**
- Inflorescence without glandiferous hairs; fls in clusters of 3 or more and arranged in a spike or panicle 2
2. Filaments of the stas covered with violet or purple hairs. Lower ls cordate at the base.—Hills, road-sides; distrib. 7 **nigrum L. 1591.**
- Filaments of the stas with white hairs 3
3. Ls more or less decurrent. Anthers of the 2 longer stas more or less decurrent 4
- Ls not decurrent. Anthers not decurrent 7
4. Cor.-limb concave. Anthers of the 2 longer stas decurrent to a short distance, that is to say, the free part of the filament 4 times as long as the anther. Stig. capitate, not decurrent. Type of *V. Thapsus*. 5 . . . 5
- Cor.-limb almost flat. Anthers of the 2 longer stas decurrent to a longer distance: the free part of the filament only $1\frac{1}{2}$ —2 times the length of the anther. Stig. clavate, decurrent at the base. Type of *V. phlomoides* 6
5. Ls entirely decurrent (from one to the other). The 2 longer stas with glabr., or almost glabr., filaments. Cor. rather small, 20—22 mm broad. Stem 60—150 cm.—Stony, uncultivated places, wood-clearings; distrib. 7
- Thapsus L. 1592.**
- Ls shortly or half decurrent. Filaments of the stas all woolly. Otherwise as in the last, but stem lower and tomentum on the ls more yellowish.—*b. pseudothapsiforme* Rap. Ls decurrent to a longer distance, more distinctly crenate; cor. larger, 25—30 mm broad.—As the last, by preference in the mount., especially G. T. W. U, b. V. 6 **montanum Schrad. 1593.**
6. Ls entirely decurrent. Differing also from 1592 in the cor. being much larger (30—35 mm broad) and in the ls being more distinctly crenate and acuminate.—As 1592; fairly distrib. (wanting in U.). 7
- thapsiforme Schrad. 1594.**
- Ls half-decurrent. Tomentum more yellowish than in the last.—As the last, but much rarer; G. W. V. B. J. Z. 7
- phlomoides L. 1595.**
- 7 (3). Stem and branches angular-furrowed. Ls almost glabr. above, with a short gray tomentum underneath.—Waste places, hills, road-sides; distrib.; the form with white fls (*b. album Mönch*) more common in some countries than the type. 6. **Lychnitis L. 1596. *)**

*) **V. incanum Gaud.** which apparently differs in the ls being of an intenser yellow, and the capsules more pointed, in Wall.

- Stem and branches cylindric. Ls covered on both sides with a white cottony tomentum, which detaches itself in flakes. *V. floccosum* auct.—As the last; T. V. B. J. 6 **pulverulentum Vill. 1597.**

OBS. The numerous hybrid forms may be classed as follows:

- I. Ls shortly or half-decurrent. Fls clustered.
 - a. Wool of the stas white.
 - α. Anthers equal: *V. Lychnitis-Thapsus* (spurium Koch); *V. pulverulentum-thapsiforme* (f. concolor = *V. mosellanicum* Wirtg.).
 - β. Anthers of the 2 longer stas distinctly decurrent: *V. Lychnitis-thapsiforme* (ramigerum Schrad.).
 - b. Wool of the stas entirely or partly violet.
 - α. Anthers of the 2 longer stas obliquely decurrent: *V. pulverulentum-thapsiforme* (f. bicolor: nothum Koch).
 - β. Anthers equal: *V. nigrum-thapsiforme* (adulterinum Koch); *V. nigrum-Thapsus* (collinum Schrad.).
- II. Ls not decurrent.
 - a. Fls clustered.
 - α. Wool of the stas white: *V. Lychnitis-pulverulentum* (Regelianum Wirtg.).
 - β. Wool of the stas violet: *V. Lychnitis-nigrum* (Schiedeianum Koch); *V. nigrum-pulverulentum* (mixtum Ram.).
 - b. Fls solitary or 2–4 together; raceme lax; habit of 1590; *V. Blattaria-Lychnitis* (blattarioides Gaud. not Lam., *V. Pseudo-blattaria* Schleich. Koch); *V. Blattaria-thapsiforme* (Bastardi R. Sch.).

Also: *V. montanum-nigrum* (uriense Grml.).

417. *Scrophularia*. Fig-wort. XIV, 41.

1. Cymes all in the axils of true ls. Cal.-lobes without scarious edges.—Very rare and probably only adventitious; formerly near Martigny and Bischofzell; recently found again by Sandoz near Bex (Fenalet sous Gryon). 6
* **vernalis L. 1598.**
- Cymes, at least the upper ones, in the axils of bracts, forming a terminal panicle. Cal.-lobes with scarious edges 2
2. Ls undiv., toothed or crenate. Fls reddish or greenish brown 3
- Ls 1–2-pinnatisect. Fls blackish violet, variegated with white 6
3. Petioles not winged. Cal.-lobes with narrow edges. Rt-stock noded-tubercular.—Damp thickets, distrib. 6
nodosa L. 1599.
- Petioles broadly winged. Cal.-lobes with broad edges. Type of *S. aquatica* 4
4. Ls, at any rate the lower, rounded-obtuse at the top, cordate at the base and often with 2 auricles on the petiole, obtusely crenate. Staminode (rudiment of sta.) rounded-reniform, scarcely incised). *S. oblongifolia* Lois. —Damp places, ditches; W. V. 6 **Balbisii Hornem. 1600.**
- Ls acute or obtuse, not or scarcely cordate. Staminode incised or slightly 2-lobed 5

5. Ls toothed, with acute teeth. Staminode obcordate-2-lobed. Stem with erect branches.—As the last; hitherto confounded with the following! Z. 6 . * **Ehrharti Stev.** 1601.
- The lower ls crenate, the upper toothed. Staminode almost 3 times as broad as long, truncate at the base, slightly incised in front. Stem with spreading branches.—As the last; probably distrib. (hitherto we have only seen this species in Switz.). 6 . **Neesii Wirtg.** 1602.
- 6 (2). Upper lip of the cor. $\frac{1}{3}$ the length of the tube. Panicle with almost sessile glands.—Stony places, gravel-beds of rivers and lakes; in certain parts (wanting in U. S.). 8 **canina L.** 1603.
- Upper lip of the cor. more than $\frac{1}{2}$ the length of the tube. Panicle with distinctly stipitate glands. Ls more finely div. than in the last, fls and fr. larger.—Stony places, debris in the Jura. 7, 8 . **Hoppei Koch.** 1604.

418. **Linaria. Toad-flax.** XIV, 39.

1. Palate of the cor. not entirely closing the throat. Fls with fairly long peduncles, placed in the l.-axils or in lax racemes. Ls lanceolate. Pl. pubescent-glandular, rarely (b. *prætermissa Del.*) glabr. (Coppet).—Fields, walls; distrib. 6 **minor Desf.** 1605.
- Palate of the cor. closing the throat almost entirely 2
2. Fls solitary, in the l.-axils, distant. Ls broad, all, the upper as well, distinctly petioled 3
- Fls in racemes (without ls, sometimes short, almost like heads). Ls linear or linear-lanceolate, sessile or the lower narrowed to a short petiole 5
3. Ls with long petioles, cordate-orbicular, with 5—7 lobes, glabr. Perenn. pls. Fls pale violet. — Old walls and rocks, especially near lakes (wanting in G. S.). 5
- Cymbalaria Mill.** 1606.
- Ls shortly petioled, oval or orbicular-oval, entire or sinuate-dentate, hairy. Ann. pls. Fls of a more or less light yellow, with a violet upper lip 4
4. Ls gen. hastate or sagittate at the base. Peduncles capillary, gen. glabr. Cal.-lobes lanceolate. Spur almost straight.—Fields, everywhere after the crops (wanting in G. U.). 7 **Elatine Mill.** 1607.
- Ls all rounded or slightly cordate at the base. Peduncles villous. Cal.-lobes oval-lanceolate. Spur curved.—As the last (wanting in T. U.). 7 **spuria Mill.** 1608.
- 5 (2). Fls blue or violet. (Lower ls opp. or whorled) 6
- Fls yellow. (Seeds winged-marginate) 8
6. Fl-stems prostrate or ascending. Fls violet-blue, with saffron yellow palate or (v. unicolor) on the granite Alp. almost all of one colour, very rarely pale yellow (Sargans);

- b. petraea* Jord. Stem ascending; leaves and fr.-racemes more elongated; spur slenderer.—Debris on the Alp. and subalp., descending with streams; *b. Jura. 7 alpina* Mill. 1609.
- Fl.-stems erect or almost so **7**
7. Fr.-racemes elongated. Seeds emarginate. Perenn., glabr. pls.—Fields, lower Rhone-valley; very rare and gen. only changeable, scarcely indigenous. **7 striata** Dec. 1610.
- Fr.-racemes short. Seeds edged-marginate. Ann. pl. Peduncles and cal. pubescent-glandular.—As the last. **6**
arvensis Desf. 1611.
- 8 (5). Ann. pls. Lower ls opp. or whorled. Fls small (5 to 6 mm). Peduncles and cal. pubescent-glandular.—As the last. **6** **simplex** Dec. 1612.
- Perenn. pls. Ls all altern. Fls larger **9**
9. Axis of the raceme and peduncles pubescent-glandular. Fls large (25—30 mm with the spur).—Stony places, roads, fields; distrib. **7** **vulgaris** Mill. 1613.
- Axis of the raceme and peduncles always glabr. Fls $\frac{1}{3}$ smaller than in the last. Valleys of the southern Alps; W. **6** **italica** Trev. 1614.

419. *Antirrhinum*. Snap-dragon. XIV, 39.

1. Cal.-lobes oval, much shorter than the cor.; cor. very large (40—45 mm).—Old walls, especially in eastern Switz. (naturalised). **6** **majus** L. 1615.
- Cal.-lobes linear, as long as, or longer than, the cor.; cor. smaller than in the last.—Fields, stubble; not everywhere (wanting in G. U. L. A.). **6** **Orontium** L. 1616.

420. *Anarrhinum*. *Anarrhinum*. XIV, 38.

1. Rad. ls oblong-obovate, the caul. 5—7-partite. Fls small, violet, in long spike-like racemes.—Stony fields; Peney near Geneva. **6** **bellidifolium** Desf. 1617.

421. *Gratiola*. *Gratiola*. II, 12.

1. Ls opp., sessile, lanceolate, toothed. Fls in the l.-axils. —Marshy fields; fairly distrib. (wanting in W.?). **7**
officinalis L. 1618.

422. *Limosella*. *Limosel*. XIV, 36.

1. Lsspathulate-linear, radical, as also the peduncles. Peduncles shorter than the ls. Pl. 3—4 cm high.—Marshy places, shores; rather rare (wanting in G. L.). **7** **aquatica** L. 1619.

423. *Verónica*. *Speedwell*. II, 12.

1. Fls placed in the axils of bracts, forming spikes or racemes; spikes or racemes springing from the axils of ls; in 1626 and 1629 often apparently term-

- inal; in 1630 there is sometimes a smaller terminal bract 2
- Fls placed in the axils of ls or bracts, forming racemes or spikes, but the racemes or spikes are terminal 12
2. Cal. 5-partite, the 5th lobe small. (Ls almost sessile or sessile) 3
- Cal. 4-partite. 5
3. Fls pale blue or lilac. Stems numerous, slender, coated with a short, gray covering, prostrate-spreading in a circle and ascending. Ls linear-lanceolate. Racemes shorter and fls smaller than in the 2 following. Capsule glabr.—Grassy places, slopes; W. J. (Dornach). Z. Diesenhofen). 5, earlier than the following species
prostrata L. 1620.
- Fls azure blue. Stems gen. not numerous, ascending or almost erect 4
4. Ls narrow, linear-lanceolate. V. austriaca L. ex. Kern. —As the last; Neuchâtel (Brevine). 6 **dentata Schmidt. 1621.**
- Ls broader, oval or oval-oblong, with faintly cordate or rounded base. V. latifolia auct. not L.—Grassy places, slopes, road-sides; fairly distrib. (wanting in U) 6
Teucrium L. 1622.
- 5 (2). Pl. glabr. or almost glabr., growing in the water or in damp places 6
- Pl. hairy, growing on dry ground 8
6. Racemes altern. Capsule compressed, flat, broader than long, deeply incised—2-lobed. Ls sessile, lanceolate-linear. Marshy fields; fairly distrib. (wanting in G.). 6
scutellata L. 1623.
- Racemes opp. Caps. inflated, round, slightly incised 7
7. Ls shortly petioled, elliptic, obtuse.—Ditches, brooks; distrib. 5. **Beccabunga L. 1624.**
- Ls sessile, oval-lanceolate, acute.—Var. *aquatica Bernh.* See N. Beitr. II, 9.—As the last. 5 **Anagallis L. 1625.**
- 8 (5). Stem reduced, up to 3 cm (rarely longer), consequently the ls crowded together almost in a rosette, and the racemes apparently terminal, only 3—5-fl.—Alp., subalp. and high points in the Jura. 7 **aphylla L. 1626.**
- Stem 15—50 cm, ls more distant 9
9. Stems with 2 opp. lines of hairs Racemes lax, only with 2—3 fls open at a time.—Grassy places, road-sides; everywhere. 4, 5 **Chamædryas L. 1627.**
- Stems hairy all round 10
10. Ls with fairly long petioles, orbicular-oval. Capsule broader than long, incised at the base and the top (almost resembling the silicule of a Biscutella). Racemes composed of 3—7 fls.—Damp woods, not common (wanting in G. T.). 5 **montana L. 1628.**

- Ls sessile or very shortly petioled. Capsule triangular-obcordate or orbicular, not incised at the base. Racemes with 20, and more, fls **11**
- 11. Ls shortly petioled, obovate-elliptic, obtuse or acute. Fls in dense racemes. Stem prostrate and rooting at the base.—Wood-clearings; everywhere. 6
officinalis L. 1629.
- Ls sessile, oval, the upper long-acuminate. Fls in lax racemes. Stems ascending-erect. *V. latifolia* L. ex Kern.
—Mountain woods; distrib. 6 **urticifolia** L. 1630.
- 12 (1). Floral ls, the upper also, of the same form as the others and almost as large, the fls, in consequence, in the l.-axils. Fr.-pedicels spreading or reflexed. Stem branching from the base, the branches prostrate or decumbent; seeds cup-shaped, hollowed on one side and convex on the other **13**
- Floral ls, at any rate the upper, differing from the lower in form (reduced bracts) **17**
- 13. Ls with 3–7 lobes. Cal.-lobes, after flowering, cordate-oval, ciliate, bent outwards at the lateral edges. Cells of the capsule with 1–2 seeds.—Fields, walls; everywhere. 3 **hederifolia** L. 1631.
- Ls crenate-dentate. Cal.-lobes not cordate. Cells of the caps. containing 3–12 seeds **14**
- 14. Fls rather large (10–15 mm broad). Capsule incised in an obtuse angle, the lobes of the angle compressed, divergent. Fr.-pedicels much longer than the ls. *V. Buxbaumii* Ten.—Fields, road-sides; almost everywhere. 3–10
persica Poir. 1632.
- Fls much smaller (5–7 mm broad). Capsule incised in an acute or right angle, the lobes of the angle more or less swollen, almost parallel. Fr.-pedicels as long as, or rather longer than, the ls. **15**
- 15. Stas inserted about the middle of the cor.-tube. Cor. dark blue. Ls dull green, orbicular-oval, shortly hairy. —Cultivated places; rare; indicated near Morschach, Canton Schwyz; Cham, Winterthur, Chur. 4 **opaca** L. 1633.
- Stas inserted above the lower edge of the cor.-tube **16**
- 16. Cor. white, one of the lobes bluish or rose-coloured. Cells of the caps. containing 3–5 (2–6) seeds. Style not exceeding the incision. Ls of a rather yellowish green, oblong-oval, crenate-dentate.—Cultivated places; distrib. but less common than the following. 4–10
agrestis L. 1634.
- Cor. blue (very rarely white and all one colour). Cells of the caps. containing 8–10 (5–12) seeds. Style slightly exceeding the incision. Ls dark green (in Spring often small, rather shining, in Autumn larger and more hairy),

- orbicular-oval, deeply crenate-dentate.—As the last; distrib. 3—10 **polita** Fr. 1635.
- 17 (12). Bracts very small, consequently the inflorescence well separated from the leafy part of the pl. Cor.-tube longer than broad. Ls crenate-dentate, entire towards the top.—b. *hybrida* L. Pl. more vigorous; ls broader, the lower oval.—Grassy places, hills; here and there (wanting in L.). 6, 7 **spicata** L. 1636.
- Lower bracts differing little from the upper caul. ls, the separation of the inflorescence, therefore, less marked. Cor.-tube very short **18**
18. Middle ls of the stem pinnatifid or palmatipartite (rarely undiv. in dwarf pls) **19**
- Ls all undiv. **20**
19. Pedicels shorter than the cal. Racemes (also when mature) rather dense. Capsule broader than long, compressed. Seeds flat. Pl. glandular (v. succulenta All.) or without glands.—Hills, grassy places; G. T. W. V. U. 4 **verna** L. 1637
- Pedicels as long as, or longer than, the cal. Racemes lax; fls rather large. Capsule about as broad as long, inflated at the base. Seeds cup-shaped.—Fields; not everywhere (wanting in T. U. A.). 3, 4 **triphylla** L. 1638.
20. Perenn. pls; fl.-stems gen. simple (alpine pls except 1639) **21**
- Ann. or bienn. pls; stem branchy, at any rate in strong pls **25**
21. Racemes many-fl'd, elongated. Caps. broader than long, compressed, incised. Style long. Stem prostrate at the base and often rooting. Ls almost glabr.—b. *nummularioides* Lec. Lam. Ls more orbicular. Racemes pubescent-glandular, shorter.—Damp pasturages, road-sides and fields; distrib. b. Alp. and higher Jura. 5 **serpyllifolia** L. 1639.
- Racemes few-fl'd (5—10 fls, rarely more), short, at least during flowering, often corymb-shaped. Capsule oval, oblong-oval, or obovate, rather inflated, little or not at all incised **22**
22. Rad. ls larger, crowded in a rosette, persistent, the caul. 1—3 pairs, distant.—b. *Townsendi* Grmbl. (lilacina Townsend!). Pl. more robust; ls longer, distinctly toothed; anthers whitish; caps. narrowed towards the top.—Alp.; b. W. (Bellalp, Riederhorn.). 6 **bellidioides** L. 1640.
- Rad. or lower ls smaller, not in a rosette or already withered by the time of flowering **23**

23. Racemes short, dense, without glands. Fls small (5—7 mm broad). Style only $\frac{1}{3}$ — $\frac{1}{2}$ the length of the caps. Stem herbaceous.—Alp. and higher parts of the Jura. 7

alpina L. 1641.

- Racemes more or less elongated. Fls larger (10—12 mm broad). Styles about as long as the caps. Stem woody at the base 24

24. Racemes pubescent-glandular. Cor. light rose-colour, with darker veins.—Stony, calc. places of the Alp. and subalp.; Dôle and Reculet in the Jura. 7

fruticulosa L. 1642.

- Racemes covered with jointed hairs, not glandular. Cor. blue with a red ring at the throat. Caps. narrowed towards the top. Caul. ls more distant than in the last. —By preference on granite soil; Alp., Crêt du Miroir in the Jura. 7 *saxatilis* Jacq. 1643.

- 25 (20). Pedicels shorter than the cal. Ls cordate-oval, the upper sessile. Two of the cal.-lobes strikingly larger.—Grassy places, road-sides; distrib. 4, 5 *arvensis* L. 1644.

- Pedicels longer than the cal. (V. serpyllifolia, which might be looked for here, is distinguished by its stems being prostrate at the base and rooting, also by its long style) 26

26. Caps. broader than long, div. almost to the middle into 2 rounded lobes. Seeds flat. Ls feebly crenate.—Fields, rare; T. W. V. B. J. Z. 4 *acinifolia* L. 1645.

- Caps. longer than broad, faintly incised. Seeds cup-shaped. Ls distinctly crenate.—Fields; T. W. V. J. Z. S. 3, 4

præcox L. 1646.

424. *Erinus*. *Erinus*. XIV, 42.

1. Ls spathulate, crenate towards the top. Fls in racemes, violet-rose.—Alp., subalp. and Jura, especially on calc. soil. 6 *alpinus* L. 1647.

425. *Digitális*. Fox-glove. XIV, 42.

1. Cor. (yellow) large (30—45 mm long), campanulate, spotted with brown inside. Ls pubescent underneath or on both sides. D. grandiflora All.—Stony, wooded slopes; distrib. 6 *ambigua* Murr. 1648.
- Cor. smaller (20—22 mm long), tubular, not spotted. Ls glabr., ciliate.—As the last (wanting in S.). 6 *lutea* L. 1649.

OBS. Hybrid: *D. ambigua-lutea* (media Roth.)—*D. purpurea* L. is often cultivated in gardens.

426. *Alectorólophus*. *Alectorólophus*. XIV, 33.

1. Teeth of the upper lip of the cor. very short, whitish, more rarely violet (v. vittulatus) and then the stem

streaked with brown. Bracts green, or slightly tinted with brown.—Varied: Ls only half as broad (v. *stenophyllus*).—Rather damp meadows; distrib. b. Alp. 5

minor Wimm. Grab. 1650.

- Teeth of the upper lip of the cor. longer than broad, gen. violet.*) Bracts, especially the upper ones, pale. Stem gen. marked with small brown streaks 2
- 2. Lower lip of the cor. directed forwards, almost parallel with the upper lip 3
- Lower lip of the cor. spreading below; upper lip much curved-ascending (cal. glabr.) 4
- 3. Cal. glabr. or covered with scattered hairs. Seed broadly winged. Differing also from *A. minor* in the fls being rather larger (cor. 20 mm long), in the cor.-tube being rather bent and the bloom later.—Meadows, pasturages; much rarer than *A. minor* and *A. hirsutus*; not everywhere. 6 **major Wimm. Grab. 1651.**
- Cal., as also the bracts, more or less strongly villous. Seed narrowly winged. Cal. with a closer net-work of veins than in the last.—Among the corn, also in fields; distrib. 6 **hirsutus All. 1652.**
- 4. Ls oblong-lanceolate. Bracts as in *A. major*, but rather more deeply incised. Cal. often spotted with black. Cor. pale yellow; lower lip small.—Alp.; G. W.! V.! and probably in other parts. 7, 8 **alpinus Garck. 1653.**
- Ls linear-lanceolate. Bracts long-acuminate, with deep, linear-subulate teeth terminated by an awn. Cal. not spotted 5
- 5. Stem 3--6 dm; branches spreading.—Hills and pasturages exposed to the sun, especially on calc. soil (wanting in W.). 7, later than *A. major* and *A. hirsutus* **angustifolius Heynh. 1654.**
- Stem lower; branches, if any, less spreading.—Alp.; Engadine! and probably in other parts also. 7, 8 **aristatus (Cel.) Grml. 1655.**

427. *Pedicularis*. Louse-wort. XIV, 40.

- 1. Caul. ls whorled or 3 or 4 together. Fls red.—Alp. 7 **verticillata L. 1656.**
- Caul. ls altern. or 0 2
- 2. Fls red, very rarely white 3
- Fls yellow 11
- 3. Upper lip of the cor. prolonged in a distinct beak, more or less long, but without lateral teeth 4
- Upper lip of the cor. with neither beak nor teeth, or

*) *A. hirsutus* very rarely varied with pale teeth, and then the stem is not streaked (v. *leucodon*).

430. **Bartsia. Bartsia.** XIV, 35.

1. Ls opp., oval, crenate-dentate, the fl.-ls violet. Fls dark violet, in a short spike. Anthers covered with white wool.—b. *parviflora* Charp. Fls much smaller, pedicels much longer.—Alp., subalp. and Jura. 6 **alpina** L. 1676.

431. **Euphrasia. Eyebright.** XIV, 35.

1. Lobes of the lower lip undiv. or faintly emarginate. *Odontites auct.* 2
- Lobes of the lower lip deeply incised or 2-fid. Type of *E. officinalis* 5
2. Fls red. Type of *E. Odontites* 3
- Fls yellow 4
3. Bracts longer than the fls. Cal.-lobes lanceolate. Stem 15—25 cm, not very branchy; branches spreading-erect. —Among the corn; distrib. 6 **Odontites** L. 1677.
- Bracts shorter than, or scarcely as long as, the fls. Cal.-lobes almost triangular. Stem gen. taller than in the last, with more numerous, slenderer, more spreading branches. *E. divergens* Jord.—Fields after mowing, damp pasturages, road-sides, ditches; as widely distrib. as the last but much later. 8, 9 **serotina** Lam. 1678.)*
4. Pl. covered with crisp, glandless, hairs. Fls of a fine yellow.—Dry hills; local (wanting in U. L.). 7, 8 **lutea** L. 1679.
- Pl. covered with spreading, glandular hairs. Fls pale yellow.—Pine woods; W. (Bois de Finges and between Varen and the baths of Leuk). 7 . **viscosa** L. 1680.
- 5 (1). Fl.-ls, at any rate the upper ones, covered like the cal. with spreading glandiferous hairs 6
- Pl. absolutely without glandiferous hairs 8
6. Cor. small, tube enclosed. Ls broad, the upper much crowded; teeth broad, those of the lower ls (and often also of the middle ls) obtuse. Stem stiff, gen. simple, with abundant jointed, partly band-shaped, pointed hairs. —Alp.; G. W. V. O. J. Freibg.! 7 **hirtella** Jord. 1681.**)

*) **E. Kochii** F. Schultz differs from *E. serotina* and *E. Odontites* in its anthers being glabr. (not bearded) at the base; Schultz has erroneously indicated it as growing in Switzerland.

) The following forms still stand in need of further examination: **E. brevipila Burn. and Grml. according to Townsend, in the Journ. of Botany 1884, with glandiferous hairs less abundant, distinctly shorter, the teeth of the upper ls terminated by a short awn, and the fls rather larger. Upper Wall.—**E. puberula** Jord.! differing from *E. brevipila* in the absence of glands, from *E. nemorosa* and *ericetorum* in the dense, spreading, rather stiff hairs, found (at least in very near forms) near St. Nicolas in Wall., closely allied to *E. parviflora* Fr. of the north.—**E. mixta** Grml. ined. (*hirtella-officinalis*? Favrat) habit of *E. montana*, hairs of *E. hirtella*, but fls much larger than in this last. Lavanchy above Bex.

- Cor. large or medium sized (8—12 mm long), with a more or less prominent tube. Type of *E. officinalis* 7
- 7. Stem almost always branchy. Ls oval or oval-oblong, numerous, crowded. Teeth of the lower ls gen. acute, of the upper acuminate. Pl. gen. with abundant glands. Cor. large, white, streaked with violet, with a yellow spot on the lower lip, the upper lip sometimes tinted with violet. *E. Rostkoviana* Hayne, *E. pratensis* Fr.—*b. campestris* Jord. (*uliginosa* Ducom.). Pl. less glandular, with shorter hairs, branches more spreading and ls smaller.—Meadows, pasturages, wood-clearings; everywhere. 6 ***officinalis* auct. 1682.**
- Stem simple, rarely branchy. Ls broad-oval, less numerous, and the inflorescence consequently interrupted. Teeth of the lower and middle ls obtuse, of the upper acute or slightly acuminate. Cor. as in the last. Pl. gen. less glandular, earlier.—Damp pasturages; G. T. W. V. J. Uri. A. Schwyz! 5, 6 . . . ***montana* Jord. 1683.**
- 8 (5). Cor. large, broad (9—14 mm long), with a prominent tube, often entirely violet, or tinted with purple-violet. Stem gen. only 3—5 cm, but frequently branchy. Lower ls narrow, with obtuse teeth, upper broad, with long-awned, acuminate, spreading teeth.—Varied: Pl. glabr. or (*b. vestita*) covered with a short, more or less dense pubescence.—Central Alp., on granite. G.! W.! 7
***alpina* Lam. 1684. *)**
- Cor. small or medium sized, with tube gen. enclosed 9
- 9. Ls always glabr., narrow, lanceolate or oblong-lanceolate, very cuneiform at the base; teeth gen. only 2—4 on each side, distant, deep, spreading (so that the edge between the teeth continues almost in a straight line!), acuminate with capillary point. Fls always small. *E. cuprea* Jord.!—*b. permixta* Grml. (*salisburgensis* Jord.!) Stem often less branchy; ls broader, with less spreading teeth; racemes shorter. Recalling *E. majalis*.—Alp., subalp. and Jura; *b.* lower-lying parts. G. W. V. B. A. J. 6 ***salisburgensis* Funk. 1685.**
- Ls oval or oval-oblong, not, or shortly, cuneiform at the base; teeth less deep and directed more forwards 10
- 10. Cor. very small; lower lip gen. yellow, upper lip pale or tinted with violet (*v. bicolor*); or (*v. flava*) cor. entirely yellow; or (*v. pallida*) cor. coloured much as in

*) A form approaching *E. officinalis* (***E. versicolor* Kern.?**) in the Eginenthal.—***E. arguta* Kern.**, placed by Townsend by the side of *E. alpina*, appears to us to be rather a neighbour or identical with *E. officinalis* var. *alpestris* (better *v. anadena*) Grml.; this form, differing from *E. offic.* in its almost glabr. glandless ls, may also be found in this country.

- E. officinalis*. Caps. gen. as long or longer than the ls. Teeth of the ls gen. 1–3, those of the lower ls obtuse (with a broadly rounded terminal one), those of the upper ls acute, rarely (v. *subaristata*) acuminate with a short awn, or, in a very small high alpine form (v. *minor* Jord.) all obtuse. Varied: pl. glabr. or more or less covered with a short pubescence.—Alp. and Jura. G.! W.! V.! B.! J.! A.! **minima** Jacq. 1686.
- Lower lip of the cor. never entirely yellow, upper lip white or tinted with violet, or cor. entirely violet. Caps gen. shorter than the ls. Teeth 3–5 on each side. Type of *E. nemorosa* **11**
11. Teeth of the upper ls acuminate, but without or with a short awn. Racemes gen. lax. Fls small. Capsules emarginate at the top. Stem branchy, especially about the middle, with rather spreading branches. *E. rigidula* Jord. —Varied: with dense racemes and thick stem; teeth less acuminate (v. *nitidula* Reut.), and slender stems, lax racemes and capsules as long as, or longer than, the ls (v. *macilenta* = *E. gracilis* Gren.?)—Pasturages, wood-sides, often with *E. officinalis*; G.! V.! Neuchâtel! Bern! Thurgau! Schaffh.! the var. *nitidula* hitherto only in the Jura. 7, 8. **nemorosa** H. Mart. 1687.
- Teeth of the middle and upper ls acuminate with a more or less long, capillary awn. Racemes dense (especially towards the top). Capsules truncate or rounded at the top. Fls often rather larger than in the last. Stem gen. branchy from the base, with long, almost erect branches, and often bearing fls from the base upwards. Ls and cal. almost or entirely glabr. as in the last. *E. aristata* Favr. Grml., *E. pectinata* Ten.?—b. *majalis* Jord.! (*stricta* Schl. sec. Favrat). Ls light green, the fl.-ls broader, with more spreading teeth; racemes shorter. Pl. often rather hairy, earlier, often with a simple stem.—As the last, but probably only in southern and south-western Switz. Tess.! Wall.! Geneva! b. Tess.! Wall.! 7, 8 **ericetorum** Jord. 1688.

OBS. *E. minima-salisburgensis* according to Jäggi on Pilatus; *E. ericetorum-salisburgensis*? Chéseret, Canton Vaud (Favrat!).

432. *Lathræa*. *Lathræa*. XIV, 29.

1. The whole pl. whitish, with a rosy tint. Raceme unilateral, drooping at the top before flowering.—Parasitic on the rts of various trees with decid. ls; here and there (wanting in G.). 4 **squamaria** L. 1689.

77. Orobanchaceæ.

433. *Phelipæa*. *Phelipæa*. XIV, 30.

1. Fls 12—18 *mm*. Cal. with 4 teeth. Stem gen. branchy.
— On Tobacco and Hemp. 8 . *ramosa* C. A. Mey. 1690.
- Fls 22—30 *mm*. Cal. with 5 teeth, the fifth very small.
Stem simple 2
2. Cor.-tube almost straight, much enlarged above. Lobes
of the lower lip obtuse. Anthers hairy the whole length
of the suture.—On *Artemisia campestris*; W. V. 6
arenaria Walp. 1691. *)
- Cor.-tube bent, narrow; lobes of the lower lip fairly
acute. Anthers glabr. or only hairy at the obtuse end.
Ph. *purpurea* Aschers.—On *Achillea millefolium*, not
common (wanting in U. A.). 6 *coerulea* C. A. Mey. 1692.

434. *Orobanche*. Broomrape. XIV, 30. **)

1. Stig. yellow, or with a reddish line round the base 2
— Stig. red, brown or violet 12
2. Seps with several nerves 3
— Seps 1—3-nerved. (Cor. campanulate or campanulate-
tubular) 8
3. Stas inserted at about the base of the cor. Cor. 18 to
25 *mm* long, broad, campanulate, crop-shaped in the
front of the base. On the Papilionaceæ 4
— Stas inserted in the lower quarter of the cor.-tube. Cor.
18—25 *mm* long, campanulate, but not swollen in front.
(Lips of the cor. ciliate-glandular at the edges.***)
- Stas inserted in the lower third of the cor.-tube or still
higher. Cor. 20—25 *mm* long, tubular-campanulate****) 5
- * 4. Stas with filaments very hairy below. Cor. yellowish at
the base, then streaked with purple and blood-red at
the throat (rarely entirely yellowish: v. *citrina*); lips
fringed-ciliate at the edges. Stem 10—40 *cm*. O. *gracilis*
Sm.—On Lotus, Hippocrepis, Genista, &c.; G. W. V.
J. Z. 6 *cruenta* Bert. 1693.
- Stas with filaments entirely glabr., at any rate below.
Cor. red or brownish; lips obscurely denticulate, but

*) *Ph. ionanthe* Kern. (*coerulea* Schl. exs.), parasitic on the *Artemisiæ*, is, judging by specimens from the Tyrol, a form of *Ph. arenaria*.

**) The colour of the stig. should be first noted and, if possible, the nutritive pl.; then cut a cor. longitudinally down the back so as to see the pubescence and insertion of the stas.

***) Here the yellow varieties of *O. caryophyllacea* and *O. Epithymum* may be sought.

****) Here the robust forms of *O. Hederae* with several-nerved seps may be sought; this species differs from the following ones in its smaller, tubular, almost glabr. corollas.

not ciliate. Stem often taller than in the last, much swollen at the base; spike gen. denser.—On *Sarothamnus* in transalpine Switz. 5 . . . **Rapum Thuill.** 1694.

5. Cor. reddish brown, yellowish and curved at the base, straight as far as the middle, then bent downwards. Stem 30—40 *cm*, not or only slightly, inflated at the base. Spike gen. rather lax. Seps broad, unequally 2—3-fid. Filaments of the stas hairy, at any rate to about the middle. — ? b. *Medicaginis Duby*. Cor. slenderer; lemon-yellow.—On *Medicago sativa* and *falcata* and on *Melilotus*, rare; Graub., Bâle, Schaffh., St. Gallen. 7

rubens Wallr. 1695.

- Pl. without the above characteristics **6**

6. Seps distinct and distant, distinctly shorter than the cor.-tube; often a third on the back! Stas inserted about the middle of the tube, the filaments only hairy in the lower portion. Stem 30—50 *cm*. Cor. of a fawn-yellow, tinted with violet; lips not glandular-ciliate at the edges. *O. brachysepala* F. Schultz, *O. Buekiana* Koch.—On *Peucedanum Cervaria* and *Seseli Libanotis*; Salève, Orbe, Neuchâtel, Zofingen (Lüscher), Wülflingen (Zürich), Schaffh. 6 **Cervariæ Suard.** 1696.

- Seps 2, contiguous or united at the base. Stas inserted in the lower third of the tube, the filaments hairy almost to the top. Stem 50—80 *cm* **7**

7. Cor. reddish brown; lips not or hardly ciliate-glandular at the edges. Stem much swollen at the base. *O. stigmatodes* Wimm. Koch? (var. with violet stig.?)—On *Centaurea scabiosa*; Chur, Ponte (Graub.), Martinsberg (Wall.), Rochefort, Schwarzenmatt (Bern), Morschach (Schwyz). 6 **elatioer Sutt.** 1697.

- Cor. brownish yellow, streaked with violet; lips distinctly glandular-ciliate at the edges. Stem very robust, swollen at the base into a large scaly ball. Spike elongated (up to 20 *cm* and more), strong, dense.—On *Laserpitium Siler* in the Jura (Vaud, Neuchâtel), Salève, Schwarzenmatt (Bern). 7 **Laserpitii Sileris Rap.** 1698.

- 8 (2). Stas inserted in the lower quarter of the cor.-tube. (Cor. campanulate-tubular, 16—20 *mm* long, distinctly arched; lips feebly ciliate-glandular. Seps enlarged at the base. Filaments of the stas very hairy, at least as far as the middle. Stig. velvety) **9**

- Stas inserted in the lower third of the cor.-tube or higher **10**

- 9 Cor. brownish yellow; upper lip with spreading lobes. Stig. bright yellow or brownish.—On *Berberis* (and *Rubus*?); Lower Engadine, Tess. 7 **lucorum A. Br.** 1699.

- Cor. yellow; upper lips with lobes stretched forwards. Stig. wax-yellow. In other respects like the last, but

seps rather longer; lips of the cor. more distinctly denticulate. On *Salvia glutinosa*; G. W. T. U. Z. A. 7

***Salviæ* F. Schultz. 1700.**

10. Cor. 12—18 *mm* long, tubular, yellowish, streaked with violet; lips not ciliate-glandular at the edges. Stas (often prominent!) with filaments glabr. or very slightly hairy below. Spike elongated, lax. Very near to *O. minor*, but cor. almost glabr. and stig. yellow.—On Ivy; Vaud, Neuchâtel, Arlesheim (Bâle), Schaffh.? 6

***Hederæ* Vauch. 1701.**

- Cor. 15—20 *mm* long, campanulate-tubular, yellow like the rest of the pl.; *) lips ciliate-glandular (*Frölichii*?) **11**
11. Upper lip of the cor. with reflexed lobes (as in *Antirrhinum*). Stig. wart-like. Seps distinctly shorter than the cor.-tube. Filaments of the stas very hairy, at any rate about the middle.—On *Petasites officinalis*, *albus* and *niveus*; G. T. V. O. U. A. 6. ***flava* Mart. 1702.**
- Upper lip of the cor. with lobes stretched forwards. Stig. velvety. Seps equal to or exceeding the cor.-tube. Filaments of the stas hairy below. (*O. Salviæ*, which might be sought here, has the stas inserted lower and the filaments more villous).—On *Petasites albus*; Appenzell (Rchb. f.). 6. ***Frölichii* Rchb. f. 1703.**)**
- 12 (1). Stas inserted in the lower quarter of the cor.-tube. (Seps with several nerves. Lips of the cor. ciliate-glandular at the edges) **13**
- Stas inserted in the lower third of the cor.-tube or higher. (Cor. tubular or campanulate-tubular) ***) **16**
13. Filaments of the stas very hairy, at least to the middle. Seps gen. 2-fid, about half as long as the cor.-tube. (Lobes of the lower lip of the cor. equal or almost equal) **14**
- Filaments of the stas feebly hairy or glabr. Seps entire, more rarely 2-fid, about equal to, or longer than, the cor.-tube. (Cor. campanulate) **15**
14. Cor. campanulate, 22—28 *mm* long, brownish yellow, tinted with red, arched at the back; upper lip stretched forwards. Spike gen. long and many-fld. Stem 20—50 *cm*. *O. Galii* Vauch.—b. *strobiligena* Rchb. Pl. entirely yellow. —On *Galium*; fairly distrib. (wanting in U. L.). 6

***caryophyllaceæ* Sm. 1704.**

*) *O. flava* varied according to Rhiner: reddish, bluish and (on *Aconitum Lycoctonum*) whitish (v. *albicans*).

**) We do not know this species. The figure which its author has given resembles *O. flava*, but the stas are inserted about the middle.

***) For *O. Lucorum* with the brownish stig. see 9. It differs from *O. Picridis* in its cor. being distinctly arched, its lips feebly glandular-ciliate, the upper 2-lobed, and in its stas being inserted lower.

- Cor. campanulate-tubular, 20—22 *mm* long, reddish brown, the back straight or almost so; upper lip bent in an inclined hood. Spike short, few-fl. Stem 10—20 *cm*.— On *Teucrium*; fairly distrib. (wanting in L.). 6
Teucriti Holl. Schultz. 1705.
- 15. Cor. reddish brown, 18—22 *mm* long, the back slightly arched, covered on the outside with hairs springing from small brownish tubercles; middle lobe of the lower lip distinctly larger than the lateral lobes. Stig. deep purple. Stem 10—15 *cm*. Spike lax, few-fl. Cor. with an ampler tube than in *O. caryophyllacea*. Seps gen. entire, longer in proportion.—On *Thymus*; distrib. 6
Epithymum Dec. 1706.
- Cor. yellow, tinted with violet, 20—25 *mm* long, arched from bottom to top, covered outside with hairs springing from blackish tubercles; lobes of the lower lip almost equal. Stig. blackish violet. Stem gen. taller and thicker than in the last; bracts much exceeding the cor., often blackish when dry. *O. platystigma* Rchb.? — On *Carduus defloratus* and *Personata*, *Cirsium oleraceum* and *Scabiosa Columbaria*; Geissfluh (wanting in L. Z. S.). 6 **Scabiosæ Koch. 1707.**
- 16 (12). Filaments of the stas very hairy, at least to the middle. Upper lip of the cor. entire or subemarginate. (Cor. campanulate-tubular) **17**
- Filaments of the stas slightly hairy below, or glabr. Upper lip of the cor. 2-lobed. (Seps pale, 3—several-nerved or in *O. minor* sometimes 1—2-nerved. Lips of the cor. not ciliate-glandular at the edges) . . . **18**
- 17. Seps entire, 1-nerved or with a tooth and then 2—3-nerved, equal to or longer than the cor.-tube. Cor. yellowish white, 15—17 *mm* long, the back straight, arched at the top; lips not ciliate-glandular at the edges. Stem 20—40 *cm*. Spike many-fl, elongated. Like *O. lorica*, but more hairy above; corollas smaller.—On *Picris*; Lägern (God.). 6 **Picridis Vauch. 1708.**
- Seps 2-fl, several-nerved, about half as long as the cor. Cor. reddish brown, 20—22 *mm* long, the back straight, curved in an inclined hood at the top; lips ciliate-glandular at the edges. Stem 10—20 *cm*. Spike lax, few-fl. See *O. Teucriti*. 14.
- 18. Cor. campanulate-tubular, 16—20 *mm*, yellowish with reddish streaks, the back straight or almost so, bent down only at the top. Seps almost 2-partite, with narrow, long divisions. Style yellow. *O. Artemisia campestris* Vauch. Gaud.—On *Artemisia campestris*; Wall. 6
loricata Rchb. 1709.

- Cor. tubular, 12—15 *mm* long, whitish with lilac streaks or often tinted with violet, the back evenly arched. Seps entire or 2-fid. Style violet.—On clover and various other pls; distrib. 6 . . . minor **Sutt.** 1710.

78. Labiatae.

435. *Lavándula*. Lavender. XIV, 5.

1. Ls linear. Bracts of the whorled clusters brown, scarious, oval-rhomboidal, acuminate. Fls blue. *L. vera* Dec.—Hills; subspontaneous near Neuveville, and often cultivated in gardens, as also *L. latifolia* Vill. (with broad ls and linear bracts). 7 . . . † **officinalis** **Chaix.** 1711.

436. *Mentha*. Mint. XIV, 3.

1. Cal. almost bilabiate, the throat closed by hairs after flowering. Fl.-clusters axillary. *Pulegium vulgare* Mill.—Inundated places, rare; Tess., Vaud (Lavigny); Geneva. 7 . . . **Pulegium** **L.** 1712.
- Cal. regular, with 4 teeth; throat bare or hairy, but not closed by hairs . . . 2
2. Clusters placed in the axils of ordinary ls, or the upper ones forming a head-shaped inflorescence . . . 3
- Clusters in the axils of reduced bracts, more or less crowded and in gen. form resembling an uninterrupted (at least above) spike . . . 6
3. Clusters crowded together in a head at the top of the stem, having 1—2 (rarely more) separate clusters below the top, which are peduncled and supported by a leaf. Cal. tubular-infundibuliform; teeth triangular at the base, long-subulate. Ls petioled, oval or oval-oblong, gen. covered with scattered hairs, rarely (*v. hirsuta* auct.) covered with a stronger, denser villosity, or (*v. glabrata*) almost glabr. We have never seen pls entirely glabr. in Switzerland except as regards the cal-tube (*v. citrata* Ehrh.).—Ditches and brooks; everywhere. 7 . . . **aquatica** **L.** 1713.
- Clusters all separate and placed in the axils of common ls. Stem terminated by a cluster of ls . . . 4
4. Fr.-cal. short, campanulate, the teeth triangular-oval, short, about as broad as long. Ls petioled, oval or elliptic.—Fields after mowing, ditches, shores; everywhere. 7 . . . **arvensis** **L.** 1714.
- Fr.-cal. tubular-campanulate or tubular-infundibuliform; teeth triangular-lanceolate, acuminate, longer than in the last . . . 5
5. Cal. glabr. at the base, rough above. Cor.-tube glabr. inside. Pl. gen. almost glabr., with abundant glands

and a scent of Basilicum. *M. cardiaca* Ger., *M. rubra* Sole (Gaud.?), *M. Pugeti* Per., *M. Pauliniana* F. Schultz. —Shores, rare; W. V., lake of Wallenstadt; sometimes escaped from peasants' gardens (*M. hortensis* Tausch). 7

gentilis L. 1715.

- Cal. entirely hairy. Cor.-tube hairy inside. Pl. more or less hairy. Cal. of 1713; inflorescence of 1714; hybrid? *M. sativa* auct.—Shores, damp meadows, not common, but distrib. 7 *verticillata* L. 1716.

6 (2). Ls with a distinct (fairly long) petiole. Spikes thick, oblong-cylindric, gen. interrupted at the base 7

- Ls sessile or very shortly petioled. Spikes cylindric, slender, gen. uninterrupted 8

7. Cal.-teeth linear-subulate. Achenes wort-like. Ls rather shortly petioled, oval or cordate-oval, hairy on both sides, gray underneath. Ls almost of 1713; inflorescence of 1721 but thicker; probably hybrid: *M. aquatica-sylvestris*. *M. Ayassei* Malinv. —As the last, rare; W. V. Geneva! Neuchâtel! Bâle! 7 **nepetoides* Lej. 1717.

- Cal.-teeth lanceolate-subulate. Achenes smooth. Ls with a medium petiole, oblong or oblong-oval, covered with scattered hairs, or almost glabr. Pl. with a strong aromatic odour. *M. viridis* is easily distinguished by its almost sessile ls, its slenderer spikes and its shorter cal. Pepper-mint.—Cultivated. 7 †*piperita* L. 1718.

8. Fr.-cal short-campanulate, almost globular, rough; cal.-teeth and bracts lanceolate-subulate. Ls orbicular-oval, obtuse or short-acuminate, crenate, rarely (v. serratifolia) toothed, with a net-work of wrinkles, gray-tomentose underneath—b. *crispa* Fuchs with crisp ls.—Ditches, brooks; southern and western Switz., Zürich, lake of Wallenstadt; b cultivated. 7 *rotundifolia* L. 1719.

- Fr.-cal. campanulate; cal.-teeth and bracts linear-subulate, narrower than in the last. Ls oblong-lanceolate or oblong-oval, twice, or at least 1½ times, as long as broad, toothed 9

9. Ls almost glabr. on both sides, or with scattered hairs underneath. Achenes almost smooth. Stolons above ground, leafy. Pl. with an agreeable smell of peppermint. Spikes slender.—b. *crispata* Schrad. *) with crisp ls.—As the last; western Switz. as far as Aargau. 7 *viridis* L. 1720.

- Ls hairy on both sides, gray-tomentose at any rate underneath. Achenes warty. Stolons subterranean, scaly. Type of *M. sylvestris* 10

10. Ls oblong-lanceolate or lanceolate with rounded or hardly cordate base, the surface fairly smooth, covered on both

*) Under the name "*M. crispa*" (crisp mint) are found the forms of various species with crisp ls; the true *M. crispa* is derived partly from 1713 and partly from 1718, and is perhaps a hybrid.

— Ls gen. broader than in the last, oval-elliptic, the base often rather cordate, the surface slightly wrinkled, covered underneath with a grayish, loose tomentum. —As the last and confused with it. W. Vevey! Neuchâtel! Constance! (with the last) and probably in other parts. 7 **nemorosa Willd. 1722.**

437. **Lycopus.** *Lycopus.* II, 11.

438. **Salvia. Sage.** II, 11.

1. Ls linear, the edges rolled up, white-tomentose underneath. Fls blue. *Rosmarinus officinalis* L.—Rocky places, hills; subspontaneous near Clarens and in Tess.? 4
† **Rosmarinus Spenn. 1724.**
— Ls oblong, oblong-oval, or oval 2
2. Fls of a dirty yellow, large. Upper cal.-lip entire, not toothed. Ls cordate-hastate.—Woods in the mount.; distrib. 6 **glutinosa L. 1725.**
— Fls violet, blue, rose or white. Upper cal.-lip 3-toothed 3
3. Cor.-tube with a ring of hairs inside; upper lip of the cor. not compressed (hollow) 4
— Cor.-tube without the ring of hairs; upper lip compressed 5
4. Fls of medium size, violet-blue. Style exceeding the upper lip. Ls oblong-lanceolate, white- or gray-tomentose when young, as also the branches.—Uncultivated places; T. W., probably only subspontaneous; often cultivated in gardens. 6 † **officinalis L. 1726.**
— Fls small, light blue-lilac. Style lying on the lower lip. Ls cordate-triangular, often with 2 separate auricles on the petiole, covered with a short, soft pubescence.—Road-sides, embankments; not common (wanting in U.). 7 **verticillata L. 1727.**
5. Bracts large, scarious, tinted with rose or violet, exceeding the cal. Cal.-teeth not very unequal awned—Uncultivated places, vineyards; Fully and Sierre in Wall., probably subspontaneous. 6 **Sclarea L. 1728.**
— Bracts herbaceous, gen. green and shorter than the cal. Cal.-teeth very unequal, not awned, those of the upper

lip very small.—Varied with fls only half the size (v. *parviflora*).—Dry fields, slopes; everywhere. 5

pratensis L. 1729.

439. *Origanum. Marjoram.* XIV, 8.

1. Cal. almost reg. 5-toothed. Bracts oblong-oval, red (green in white-fl'd examples).—b. *prismaticum* Gaud. Spikes elongated.—Thickety, stony places, wood-sides; distrib. b. W. (Lower Rhone-valley as far as Louèche). V. 7 *vulgare* L. 1730.
- Cal. 2-lipped, cleft almost to the base on one side. Bracts almost orbicular. Marjoram.—Cultivated. 7
† *Majorana* L. 1731.

440. *Thymus. Thyme.* XIV, 11.

1. Branches almost erect. Ls much rolled up at the edges, with clusters of ls in their axils.—Uncultivated hills; spontaneous near Neuveville and in some other places. 6
† *vulgaris* L. 1732.
- Branches prostrate or ascending. Ls flat or slightly rolled. Type of *Th. Serpyllum* 2
2. Branches almost cylindric above, and equally hairy all round. Ls rather hard, narrowed insensibly at the base, and distinctly ciliate, strongly nerved underneath. Fl.-clusters crowded in a head. Pl. rather tufted; branches elongated, decumbent, stolon-like, with short erect, seriate fl.-branchlets. *Th. angustifolius* auct. not Pers.—Grassy places, sandy hills; gen. rarer than the following; G. W. V. J. O. Z. U. 6 *Serpyllum* L. 1733.
- Branches distinctly quadrangular above, covered with long hairs at the angles. Ls thinner, suddenly contracted to the petiole, faintly nerved underneath. Clusters arranged in a spike. Pl. forming a dense tuft.—b. *lanuginosus* Schk. Pl. rough-villous.—Slopes, hills; everywhere. 6 *Chamædryas* Fr. 1734.
- Branches quadrangular, rough-villous, as also the ls, with long white hairs. Ls rather hard, insensibly narrowed at the base, with deep spots underneath. Clusters arranged in a spike.—Tess., central and lower Wall. 6
pannonicus All. 1735.

441. *Satureja. Satureja.* XIV, 20.

1. Ls narrow-lanceolate, entire. Fls small, bluish white. 7
† *hortensis* L. 1736.

442. *Micromeria. Micromeria.* XIV, 20.

1. Middle and upper ls linear-lanceolate. Fls rose-coloured.—T. (Gandria; now very scarce). 6 *graeca* Benth. 1737.

443. *Calamintha*. Calamint. XIV, 12.

1. Clusters many-fl'd, dense, surrounded by bracts which are numerous, long, bristly, long-ciliate and forming an invol. *Clinopodium vulgare* L.—Wooded, stony places; distrib. 7 **Clinopodium Spenn. 1738.**
- Clusters without bracts, or the bracts small, not numerous, and not forming an invol. 2
2. Clusters peduncled (pedicels on a common branched-dichotomous peduncle) 3
- Clusters sessile (pedicels 3–5 together, placed in the l.-axils, without a common peduncle) 6
3. Clusters few-fl'd (3–5 fls). Cor. large, more than 30 mm long. Ls toothed, with deep, acute teeth.—Stony, thickety places, road-sides; T. O. (Wissembourg), W. (Arbignon). 7 **grandiflora Mönch. 1739.**
- Clusters several-fl'd (5–15 fls). Type of *C. officinalis* 4
4. Clusters shortly peduncled, the ramifications stretched forwards, umbel-shaped (springing almost from the same point), shorter than the ls. Ls with smaller and less distinct teeth than in 1741. Fls smaller, paler. Cal. shorter. Rt-stock not creeping. Hairs of the cal.-throat not prominent. *C. menthaefolia* Gr. Godr. not Host.—As the last; W. V. 7 **ascendens Jord. 1740.**
- Clusters with longer peduncles, the ramifications lax, dichotomous, more spreading, as long as, or longer than, the ls 5
5. Cal.-teeth very unequal, the 2 lower lanceolate-subulate, much longer than the 3 upper. Cor. 15–18 mm long (but also varied to smaller), of a purplish lilac. Hairs of the cal.-throat not or hardly prominent. *C. sylvatica* Bromf.—As the last; distrib. 7 **officinalis Mönch. 1741.**
- Cal.-teeth less unequal, the 2 lower triangular-lanceolate, not so much longer than the 3 upper. Hairs of the cal.-throat prominent between the cal.-teeth after the cor. has fallen off. Ls smaller than in the last, less distinctly toothed, stronger haired. *C. Einseleana* F. Schultz; *C. Nepeta* auct. p.—As the last; G. T. W. V. B. O. U. A. (wanting in northern Switz.). 7 **nepetoides Jord. 1742.)***
- 6 (2). Cal. closed at maturity, the upper teeth acute-triangular. Fls 10 mm long.—Dry, stony fields; distrib. 6 **Acinos Clairv. 1743.**

*) The true *C. Nepeta Savi* which is distinguished by its shorter rt-stock, its more branchy stem, its crenate, instead of toothed, ls, and its denser clusters, is found, according to Christ., in Tess. (Solduno).

- Cal. open at maturity, upper teeth lanceolate. Fls larger.
—Alp., subalp. and Jura, also descending with rivers. 7
alpina Lam. 1744.

OBS. *C. patavina* Host. (*Acinus-alpina* ?) near Ilanz (Graub.).

444. **Melissa. Balm. XIV, 13.**

1. Ls oval, crenate-dentate. Clusters unilateral. Fls white.
—Hedges, road-sides; T. W. V. (naturalised). 6
officinalis L. 1745.

445. **Horminum. Horminum. XIV, 13.**

1. Rad. ls large, rosetted, cordate-orbicular, crenate; caul. ls small. Fls large, violet. —Alp.; G. T. 6 **pyrenaicum L. 1746.**

446. **Hyssopus. Hyssop. XIV, 19.**

1. Ls linear-lanceolate, entire. Clusters unilateral, arranged in a spike. Fls blue (or white).—Rocky, uncultivated places; T. W. (naturalised). 7 **officinalis L. 1747.**

447. **Népeta. Nepeta. XIV, 18.**

1. Ls cordate-oval, gray-tomentose underneath. Stem branchy. Fls whitish, spotted with red.—Stony places, rubbish-heaps; not common (wanting in S.). 6 **Cataria L. 1748.**
- Ls cordate-oblong, green on both sides, only paler underneath. Stem with paniced branches. Fls violet or lilac.—Stony, thickety places; lower Rhone-valley, and the lateral valleys. 7 **nuda L. 1749.**

448. **Glechóma. Glechóma. XIV, 18.**

1. Ls orbicular-reniform or orbicular-cordate, coarsely crenate or toothed. Stem creeping for a long distance, with erect fl.-branches.—Slopes, walls; everywhere. 4
hederácea L. 1750.

449. **Dracocéphalum. Dracocéphalum. XIV, 17.**

1. Ls linear-lanceolate, undiv., entire.—Alp.; G. W. V. B. A. 7 **Ruyschiana L. 1751.**
- Ls pinnatipartite, with 3—7 linear segments.—Rocks; G. W. (Ardez, Riddes). 5 **austriacum L. 1752.**

450. **Melittis. Melittis. XIV, 15.**

1. Ls cordate-oval. Fls large (about 40 mm), variegated white and red, or entirely white.—Woods, distrib. (wanting in U.). 6 **Melissophyllum L. 1753.**

451. **Lamium. Dead-nettle. XIV, 22.**

1. Upper ls orbicular-reniform, crenate-lobed, sessile-clasping. Cal.-teeth connivent after the fall of the cor.—Fields, gardens, walls; distrib. 4—9 **amplexicaule L. 1754.**

- Ls all petioled, the upper oval or cordate-oval, with shorter petiole, but never sessile-clasping. Cal.-teeth spreading after the fall of the cor. 2
 - 2. Ann. or bienn. pls. Fls small (10—20 mm long). Cor.-tube straight 3
 - Perenn. pls. Fls larger (20—30 mm long). Cor.-tube bent 4
 - 3. Ls unequally crenate, all cordate at the base, the upper almost triangular.—As the last; everywhere. 4—9
purpureum L. 1755.
 - Ls deeply and unequally inciso-crenate, the upper rather narrowed to a petiole. Cor.-tube without a ring of hairs inside or with a fainter ring than in the last. L. incisum Willd., L. amplexicaule-purpureum auct.—As the last; western Switz., rare. 4—9 hybridum Vill. 1756.
 - 4. Cor. red, rarely light flesh-coloured, or white. Ring of hairs and contraction of the cor.-tube horizontal above the base of the tube; upper lip shortly hairy at the edges. Fresh anthers blackish brown, with orange pollen. Ls irreg. and almost doubly toothed, the upper short, almost triangular-acute.—Hedges, walls, road-sides; everywhere. 4—9 maculatum L. 1757.
 - Cor. white, the lower lip spotted with brownish green, rarely tinted with pale rose. Ring of hairs and contraction of the cor.-tube above the base oblique; upper lip long villous-ciliate at the edges. Fresh anthers velvety black, with pale yellow pollen. Ls almost equally toothed, the upper long-acuminate.—As the last, but in some parts rarer. 4—9 album L. 1758.
- OBS. *L. album-purpureum*, according to Jäggi, near Rhinau.

452. Galeóbdolon. Galeobdolon. XIV, 22.

- 1. Habit of the 2 last, but fls yellow, the lower lip streaked with yellowish brown. See N. Beitr. II, 54.—Woods; everywhere. 5 luteum Huds. 1759.

453. Galeópsis. Galeopsis. XIV, 23.

- 1. Stem not or only slightly swollen below the nodes, covered with soft hairs, gen. appressed and directed downwards, rarely glabr. 2
- Stem more or less swollen below the nodes, covered with stiff (sometimes almost prickly) hairs, and at the same time in 1763 with softer hairs, appressed and directed downwards. Teeth of the ls more numerous (6—15) than in pls of the last paragraph 4
- 2. Fls large (25—30 mm), pale yellow. Ls oval-lanceolate, soft-villous underneath, almost velvety. Cal. covered with spreading, glandular hairs. Upper lip of the cor.

- often 2-fid. *G. ochroleuca* Lam.—Fields of the Swiss plateau, scattered; W. V. J. B. L. Z. 6 **dubia** Leers. 1760.
- Fls smaller, red, rarely entirely white. Type of *G. Ladanium* L. 3
3. Ls lanceolate or linear-lanceolate; teeth not deep, distant, 1—4 on each side. Cal. covered with appressed hairs. Varied: Cal. and ls almost or entirely glabr. (v. *glabrescens*), and stronger haired, almost gray (v. *canescens* Schult.?).—Fields, especially after mowing, and gravelly, waste places; everywhere 7—8 **angustifolia** Ehrh. 1761.
- Ls broader than in the last, oblong or oblong-lanceolate; teeth deeper, crowded, 4—8 on each side. Cal. covered with glandular, spreading, hairs. Fl.-clusters more distant than in the last, fls gen. smaller; cal.-teeth gen. shorter, more erect and less unequal.—As the last, but not everywhere and mostly in the mount. and subalp.; G. ! W. ! V. ! B. J. S. 7, 8 **intermedia** Vill. 1762.
- 4 (1). Ls oval, truncate at the base or the lower almost cordate. Cor. of medium size, bright purple, the tube yellowish brown above, distinctly longer than the cal.-teeth.—Wood-clearings, road-sides; transalpine Switz.; Chur, Bregenz. 7 **pubescens** Bess. 1763.
- Ls oblong-oval, rounded at the base or cuneiform 5
5. Cor. large (30—40 mm long), sulphur-yellow, the middle lobe of the lower lip violet. Cal.-teeth only half as long as the cor.-tube. *G. versicolor* Curt.—Rock-slips; G. U. A. Z. (lower Engadine; Bisithal, Urnerboden; Weiss-tannenthal; Sornthal, Canton Thurgau; Constance). 7 **speciosa** Mill. 1764.
- Cor. smaller, purplish or white, often spotted with yellow. Cal.-teeth reaching to, or exceeding, the upper extremity of the cor.-tube 6
6. Middle lobe of the lower lip almost square, flat, finely crenate or indistinctly emarginate.—b. *præcox* Jord. Stem lower, almost simple; ls more shortly acuminate, with fewer teeth; flowering almost a month earlier. *)—Fields, wood-clearings; everywhere; b. mount. and subalp. 7, 8 **Tetrahit** L. 1765.
- Middle lobe of the lower lip 4-cornered, longer than broad, bent down at last by the side-edges, distinctly emarginate or almost 2-fid at the top. Pl. softer than the last. Ls slightly cuneiform at the base; fls small.—As the last; Constance! St. Gallen, Galgenen, Canton Schwyz, Thun, 7, 8 **bifida** Bönng. 1766.
- OBS. *G. angustifolia-dubia* (= *G. Wirtgeni* Ludwig) St. Sulpice near Lausanne.

*) **G. Reichenbachii** Reut. has broader teeth on the ls, clusters crowded, and cal.-teeth remarkably long and softer. It appears to us more nearly allied to 1766. Subalp.—**G. acuminata** Rchb. indicated in Canton Vaud.

454. *Stachys*. Woundwort. XIV, 24.

1. Fls red 2
- Fls pale yellow or white and yellow 8
2. Clusters composed of 6 or more fls. Bracteoles (of the separate fls) at least half as long as the cal. 3
- Clusters 1—3- (rarely 5-) fld. Bracteoles very small or 0 5
3. Pl. green, villous, glandular above.—Mountain woods; distrib. 7. *alpina* L. 1767.
- Pl. covered with a dense white tomentum, without glands 4
4. Rad. ls gen. cordate at the base. Pl. covered with a white-woolly, long, spreading, villosity.—Stony waste places, and road-sides in warm parts (wanting in U. L.). 7
- Rad. ls narrowed at the base. Pl. covered with a more appressed, white-woolly, almost silken tomentum.—Naturalised since 1814 on a hill near La Sarraz. 7, 8
- *germanica* L. 1768.
- **lanata* Jacq. 1769.
- 5 (2). Ls cordate-oval, obtuse, almost as broad as long, crenate. Cor. hardly longer than the cal. Root fusiform. —Fields; western Switz. as far as Aargau. 6
- *arvensis* L. 1770.
- Ls distinctly longer than broad. Cor. twice as long as the cal. Rt-stock creeping 6
6. Stem glandular above. Ls with long petioles, oval or oval-oblong, acuminate, deeply cordate at the base.—Woods; distrib. 6 *sylvatica* L. 1771.
- Stem without glands (except sometimes at the top). Ls oblong or oblong-lanceolate, rounded or feebly cordate at the base, sessile or shortly petioled 7
7. Ls shortly petioled, oblong-lanceolate, almost toothed (the crenatures acuminate). Fls of a rather deep red. *St. palustris-sylvatica*!—Damp places, ditches; fairly distrib. 7 **ambigua* Sm. 1772.
- Ls, except those at the base, sessile, rarely (v. *petiolata* Cel.) the upper also petioled, oblong-lanceolate or lanceolate, crenate. Fls light rose.—Damp fields, ditches; distrib. 6 *palustris* L. 1773.
- 8 (1). Ls glabr. or almost so. Bracts of the clusters lanceolate or linear-lanceolate. Root fusiform.—Fields; distrib. 7
- *annua* L. 1774.
- Ls hairy. Bracts of the clusters oval. Rt-stock hard, woody, branched.—Stony places, hills; distrib. 6
- *recta* L. 1775.

OBS. Hybrids: *St. alpina-lanata*; *St. alpina-sylvatica*.

455. *Betonica*. Betony. XIV, 26.

1. Fls pale yellow. *B. Alopecurus* auct. not L. (the true *B. Alopecurus* of the Pyrenees and of Dauphiné appears

to be different).—Alp.; T. O. (Calbege, Gimmelwald). 7

Jacquini Gr. Godr. 1776.

- Fls red, rarely white 2
- 2. Cal. net-veined, 12—15 mm long.—Alp. and subalp. of western Switz., rare. 7 *hirsuta* L. 1777.
- Cal. not net-veined, smaller. *B. hirta* Leyss.—b. *glabrata* Koch (officinalis Leyss.). Cal. and stem almost glabr.—Woods and wood-openings; distrib. 6 *officinalis* L. 1778.

456. *Sideritis*. *Sideritis*. XIV, 7.

- 1. Ls oblong, the fl.-ls broader, inciso-dentate, with spiny teeth. Fls pale yellow. *S. scordioides* Koch.—Rocky places in the Jura (Dôle, Reculet). 7 *hyssopifolia* L. 1779.

457. *Marrúbium*. *Horehound*. XIV, 7.

- 1. Ls cordate-oval, wrinkled, gray-tomentose underneath, Fls small, white.—Rubbish-heaps, road-sides; not common (wanting in U. S. A.). 7 *vulgare* L. 1780.

458. *Ballota*. *Ballota*. XIV, 26.

- 1. Ls cordate-oval, coarsely crenate-dentate. Fls dirty red. *B. foetida* Lam.—b. *ruderalis* Sw. Cal.-teeth less spreading, narrowed insensibly to a longer point.—Rubbish-heaps, hedges, road-sides; distrib. b. rarer. 6 *nigra* L. 1781.

459. *Leonúrus*. *Leonurus*. XIV, 21.

- 1. Lower ls palmatifid, 5-lobed, the upper 3-lobed with a cuneiform base. Fls rose-coloured, the upper lip villous.—Rubbish-heaps, road-sides; scattered (wanting in T.). 6 *Cardiaca* L. 1782.

460. *Chaitúrus*. *Chaiturus*. XIV, 25.

- 1. Habit of 1782, but ls undiv.—Hedges; Meyrin (formerly) Canton Geneva. 7 *Marrubiastrum* Rchb. 1783.

461. *Scutellária*. *Skull-cap*. XIV, 14.

- 1. Fls in the axils of scarious bracts, forming quadrangular spikes, violet, the lower lip whitish.—Alp.; western Switz. (Wall., Vaud, Freibg.). 7 *alpina* L. 1784.
- Fls in the axils of ordinary ls, distant, blue.—Damp meadows, the edges of marshes; distrib. 6 *galericulata* L. 1785.

462. *Brunella*. *Brunella*. XIV, 15.

- 1. Fls yellowish white. Teeth of the lower cal.-lip almost pectinate with stiff hairs. Ls gen. pinnatifid. Pl. more or less rough, otherwise as in *B. vulgaris*, but the tooth of the filament of the stas rather longer, and

bent.—Dry pasturages; southern and western Switz. (but wanting in W.). 6 **alba** Pall. 1786.

- Fls violet, rarely white. Teeth of the lower cal.-lip shortly ciliate with feebler hairs. Ls gen. undiv., rarely pinnatifid 2

- 2. Spike placed immediately above the highest pair of ls. Cor. 7—13 mm long, sometimes hardly longer than the cal. (v. *parviflora*). The longer stas with an acute, fairly straight, tooth below the anthers.—Varied: with pinnatifid ls (v. *pinnatifida* Pers.).—As the last; everywhere. 6 **vulgaris** L. 1787.

- Spike some distance from the highest pair of ls. Cor. much larger than in the last, 20—25 mm, but also sometimes smaller, the tube distinctly bent and the upper lip compressed-keeled. Stas long, with a short obtuse tubercle.—Varied: Ls pinnatifid, more strongly hairy (v. *laciniata*: *P. pinnatifida* Gaud. not Pers.).—As the last. 6 **grandiflora** Jacq. 1788.

463. *Ajuga*. Bugle. XIV, 4.

- 1. Fls yellow, solitary (rarely 2 together) in the l.-axils. Ls deeply 3-fid, with linear lobes.—Fields, fallow; not everywhere (wanting in G. T. A.). 6

Chamæpitys Schreb. 1789.

- Fls blue, rose or white, 3—6 together in the axils of ls which are often coloured and form a spike. Ls undiv., sinuate or crenate 2

- 2. Fl.-ls (or bracts) coarsely dentate-crenate, the lower and middle ones gen. 3-lobed. Rad. ls 0 (destroyed) at the time of flowering, rarely existing (in an autumnal form). Pl. without prostrate stolons, but often with several stems, the villosity denser than in *A. reptans*, and fls of an intenser blue.—Fields, bare mountain slopes, hills; distrib. 5 **genevensis** L. 1790.

- Fl.-ls (bracts) entire or lightly sinuate-crenate. Rad.-ls large, not destroyed by the time of flowering . . . 3

- 3. Pl. with prostrate, leafy stolons, the stolons rarely, in an alpine form (b. *alpestris*), wanting. Upper bracts shorter than, or at most as long as the ls.—Meadows, slopes; everywhere. 5 **reptans** L. 1791.

- Pl. without prostrate leafy stolons, bracts, the upper also, twice as long as the ls. Pl. with a tufty habit, pyramidal; raceme or spike often commencing from the base of the stem.—Alp. and subalp.; (entirely wanting in the Jura and lowlands!). 6 . . . **pyramidalis** L. 1792.

OBS. We have found *A. genevensis-reptans* (hybrida Kern.) near Munich (Eberle near St. Josephen).

464. **Teucrium. Germander.** XIV, 4.

1. Cal. bilabiate; upper lip broad, entire; lower lip with 4 teeth. Ls cordate-oblong, wrinkled, crenate. Fls greenish yellow, in slender spikes.—Woods, hills; distrib. 6
Scorodonia L. 1793.
- Cal. with 5 almost equal teeth 2
2. Fls yellowish white, collected in a head at the top of the spreading, tufted stems. Ls linear-lanceolate, entire, white-tomentose underneath.—Sunny slopes; gravel-beds of torrents; distrib. 7 **montanum L. 1794.**
- Fls rose-coloured, 1—3 together in the axils of ls (sometimes reduced to bracts). Ls crenate or pinnatifid, never gray-tomentose underneath 3
3. Ls 1—2-pinnatifid. Pl. villous-glandular.—Stony fields, fallow (wanting in G.). 7, 8 **Botrys L. 1795.**
- Ls undiv., crenate 4
4. Ls sessile, soft, coarsely crenate. Pl. with leafy stolons, and a smell of garlic.—Marshy meadows; not common (wanting in G. U. L. A.). 6 **Scordium L. 1796.**
- Ls, at least the lower, rather hard, inciso-crenate. Fls in the axils of smaller, often coloured, ls. Pl. shrubby, with subterranean runners.—Stony, thickety places, hills; distrib. 6 **Chamædrys L. 1797.**

OBS. Among the pls of this family *Ocimum Basilicum L.* and *Monarda didyma L.* are also cultivated.

79. **Verbenaceæ.**465. **Verbena. Vervein.** XIV, 2.

1. Ls coarsely inciso-crenate, the middle ones pinnatifid-trilobed, the middle lobe larger. Fls small, lilac, in slender spikes.—Road-sides, ditches; everywhere. 6
officinalis L. 1798.

80. **Lentibulariaceæ.**466. **Pinguicula. Butterwort.** II, 9.

1. Cor. whitish with 2 (often confluent) yellow spots on the lower lip. Spur short, conical.—Damp places of Alp., subalp. and higher Jura, rarely lower (wanting in S.). 6 **alpina L. 1799.**
- Cor. violet. Spur longer, subulate. Type of *P. vulgaris* 2
2. Cor.-lobes oblong-obovate, separate.—b. *alpicola* God. (longifolia Gaud. p.). Fls larger.—Damp meadows; distrib. 5 **vulgaris L. 1800.**

- Cor.-lobes obovate or orbicular-obovate, touching one another. Fls twice as large as in the last. Spur longer and thicker. *P. leptoceras* Rehb., *P. longifolia* Gaud. p. not Dec.—Alp. and Jura (Reculet). 6

grandiflora Lam. 1801.

467. *Utriculária*. Bladderwort. II, 9.

1. L.-segments denticulate-spiny. Palate of the cor. swollen, closing the throat. Spur 3—4 times as long as broad 2
- L.-segments not denticulate-spiny. Palate flat, leaving the throat open. Spur short like a hump . . . 4
2. Ls in two rows (forming with the stem a flat surface), dichotomous-multipartite, the bladders on separate petioles!—Swamp-ditches, rare; B. J. Z. A. (Selhofenmoos; Oeschisee; Dübendorf; Rheineck). 6
- intermedia* Hayn. 1802.
- Ls spreading in every sense, pinnatisect-multipartite, similar in form and gen. all bearing bladders . . . 3
3. Upper lip of the cor. as long as, or slightly longer than, the palate; lower lip with reflexed edges. Peduncles 2—3 times as long as their bracts. Cor. 20 mm long, of a rich yellow. *U. mutata* Leiner? See Döll Fl. v. Bad.—Marshes, ditches; distrib. 6 . . . *vulgaris* L. 1803.
- Upper lip of the cor. 2—3 times as long as the palate; lower lip almost or quite flat. Peduncles 4—5 times as long as their bracts. Cor. rather smaller, paler yellow. As the last; indicated in Canton Neuchâtel (marais des Verrières, de Motiers); near Uebischi, Canton Bern, and at Noville, Canton Vaud. 6 . . . *neglecta* Lehm. 1804.
- 4 (1). Lower lip of the cor. with edges at last reflexed. Cor. 10 mm, pale yellow.—Ditches in peat-moss; distrib. 6 *minor* L. 1805.
- Lower lip of the cor. always flat. Pl. rather stronger than the last, spur rather longer.—As the last, but rare; Bünzenermoos, Katzenssee, Klönthalersee. 6
- Bremii* Heer. 1806.

81. Primulaceæ.

468. *Trientalis*. Trientale. VII, 2.

1. Stem bearing at the top 5—7 rather large, elliptic, almost rosetted ls, from the centre of which 1—3 white, long-pedicelled fls spring.—Peat-moss, very rare; G. U. A. (Rosegthal, Bernina; Einsiedeln, Zumdorf; Wildhaus). 5 *europæa* L. 1807.

469. *Lysimáchia*. *Lysimachia*. V, 48. VI, 6. XVI, 3.

1. Fls small, about 4 mm broad. Divisions of the cor. linear, separated by small teeth. Fls forming dense, peduncled racemes, placed in the axils of the upper ls.—Marshes, water-sides; V. J. U. L. Z. A. 6 . *thyrsiflora* L. 1808.
- Fls larger, 7—20 mm broad. Divisions of the cor. broader, without teeth 2
2. Stems erect. Fls in raceme or panicle. Stas united almost to the middle 3
- Stems decumbent or prostrate, ascending, at most, at the ends. Fls solitary (rarely in pairs) in the l.-axils. Stas free or only united for a short distance at the base 4
3. Divisions of the cor. ciliate-glandular. Divisions of the cal. not edged.—Damp thickets, shores; formerly near Zürich, recently found below Kleinhüningen near Bâle; sometimes cultivated in gardens. 6 . *punctata* L. 1809.
- Divisions of the cor. glabr. at the edges. Divisions of the cal. with a red margin.—As the last; distrib. 6
vulgaris L. 1810.
4. Segments of the cal. cordate-oval. Ls cordate-orbicular, obtuse.—Damp woods, dryish ditches; everywhere. 6
Nummulária L. 1811.
- Segments of the cal. linear-subulate. Ls oval, acute. Habit of an *Anagallis*!—Shady, damp woods; distrib. 6
némorum L. 1812.

470. *Anagallis*. *Pimpernel*. V, 48.

1. Ls almost orbicular, petioled. Cor. rose-coloured, almost 3 times as long as the cal. Stem very delicate, 3—10 cm long.—Marshes; V. (Vevey). 6 . . . *tenella* L. 1813.
- Ls oval or oval-oblong, sessile. Cor. as long as the cal. or not much longer. Stem 10—30 cm 2
2. Fls of a bright red (rarely pale lilac); divisions denticulate and ciliate-glandular. Capsule with 5 streaks.—Fields; distrib. 6 *arvensis* L. 1814.
- Fls blue; cor.-divisions denticulate but not glandular. Caps. with more than 5 (up to 10) streaks. Stem more erect than in the last. Ls more acute (sometimes 3, 4 or indeed 5 in a whorl). Pedicels shorter in proportion.—As the last and often with it, but at the same time gen. rarer. 6 *coerulea* Schreb. 1815.

OBS. *A. arvensis-coerulea* near Lostorf, Canton Solothurn; Fischer, Lüscher.

471. *Centunculus*. *Centuncle*. IV, 19.

1. Ls altern., oval, sessile. Fls in the l.-axils, almost sessile, white or rose. Stem 3—5 cm.—Damp fields; rather rare (wanting in W. U. S.). 6 *minimus* L. 1816.

472. **Andrósace. Androsace.** V, 41.

1. Ls very crowded, imbricated on the branches of a cæspitose rt-stock, or those at the top of the branches spreading in a rosette and below these the dead branches of the past year. Fls solitary in the axils of the ls, sessile or pedicelled **2**
- Ls forming 1 or (in the perenn. species) several rosettes, from which springs the common peduncle bearing an umbel (sometimes through suppression with only 3 to 1 fls), surrounded by an involucre **6**
2. Ls all imbricate in a cylindric column **3**
- Ls very crowded, looser than in the pls of the last section, forming rosettes at the tops of the branches **4**
3. Ls shortly pubescent with simple hairs. Cor. white with a yellow centre.—High Alp. 7 **helvetica** Gaud. 1817.
- Ls gray-tomentose with very short stellate hairs. Cor. white or rose-coloured, the centre red. A. tomentosa Schl. Gaud.—High Alp.; southern chain of Wall. and near the lower Aar-glacier. 7 . **imbricata** Lam. 1818.
4. Ls covered with simple hairs, mixed with 3-forked hairs which are as long as the diameter of the pedicels. Cor. white, yellow in the centre. A. alpina Gaud. not Lam.—High Alp.; W. V. O. A. 7 **pubescens** Dec. 1819.
- Ls covered with simple and (or) stellate hairs which are shorter than the diam. of the pedicels. Cor. rose, rarely white **5**
5. Ls lanceolate or oblong-lanceolate. Pedicels shorter or hardly longer than the ls. Cor.-lobes not incised. A. pennina Gaud., A. alpina Lam.—High Alp., especially of eastern Switz. 7 **glacialis** Hopp. 1820.
- Ls short, elliptic, rather obtuse. Pedicels about twice as long as the ls. Cor.-lobes distinctly incised. Aretia brevis Heg.—High Alp.; Tess. (Camoghé, Garzirola), and outside our boundaries on Mt. Legnone. 7
Charpentieri Heer. 1821.
- 6 (1). Perenn. pls, with barren rosettes **7**
- Ann. or bienn. pls without barren rosettes **11**
7. Peduncles, pedicels and cal. entirely glabr. Pedicels elongated. Fls fairly large, pure white; divisions of the cor. obcordate.—Jura (Belchenfluh at Reculet), Stockhorn chain in the Bernese Alp., always on limestone. 7
lacteæ L. 1822.
- Peduncles, pedicels and cal. hairy **8**
8. Ls narrow, linear-subulate, narrowed from the base to the top. Cor. rose-coloured.—Granite Alp.; W. V. 7
cárnea L. 1823.
- Ls oblong-lanceolate, or linear-lanceolate, narrowed towards the base. Cor. white or pale rose **9**

- Cor.-limb almost flat. Cal. not swollen, with lanceolate, acuminate teeth **4**
- 4. Pedicels united in an umbel on a common peduncle of 10–30 *cm*, gen. inclined to one side, scarcely longer than the cal. Hairs as long as, or shorter than, the diam. of the pedicels. Cor. sulphur-yellow; limb 20–30 *mm* in diam.—Meadows, thickets; everywhere. 3; rather earlier than the last **elatior Jacq. 1833.**
- Pedicels radical, between the ls, without a common peduncle (rarely united in an umbel on a more or less long peduncle), erect or spreading in every sense, almost as long as the ls. Hairs longer than the diam. of the pedicels. Cor. pale sulphur-yellow, rarely rose or whitish; limb 30–35 *mm* in diam. Ls less sensibly narrowed to the base than in the 2 last. *P. acaulis* Jacq., *P. grandiflora* Lam.—Meadows and pasturages; not everywhere (wanting in L. Z. S.), but very plentiful wherever it is found. 3 **vulgaris Huds. 1834.**
- 5 (1). Cor. yellow, rarely white, very rarely rose. Peduncles, pedicels, cal. and cor.-throat white-powdery.—Calc. rocks of the Alp., subalp. and Jura (?), sometimes descending. 5 **Auricula L. 1835.**
- Cor. violet or rose, rarely white. Peduncles and pedicels not powdery **6**
- 6. Ls pubescent-glandular on both sides, and ciliate with glandular hairs. Pedicels much longer than the invols. Cal. campanulate **7**
- Ls not hairy on the surface, but sometimes viscous or shortly ciliate at the edges. Pedicels shorter than, or as long as, the invol. Cal. campanulate-tubular **8**
- 7. Ls oblong-obovate, narrowed insensibly to the petiole. Stem 10–15 *cm* (with 2–15 fls) 1–2 times as long as the ls. Stas in the androdynamous fls (with short style), inserted immediately below the throat; throat slightly powdery. Capsule longer than the cal. *P. latifolia* Koch, not Lap.; *P. graveolens* Heg.; *P. hirsuta* Vill. not All.—Alp. and subalp.; G. (especially in the Engadine). 6
viscosa All. 1836.
- Ls obovate or orbicular-obovate, suddenly contracted to the petiole. Stem 3–7 *cm*, scarcely longer than the ls. Stas of the androdynamous fls inserted rather above the middle of the cor.-tube. Capsule shorter than the cal. *P. viscosa* Vill. not All.; *P. villosa* Koch not Jacq.—Alp. and subalp. 6 **hirsuta All. 1837.**
- Ls lanceolate-cuneiform, almost truncate, toothed only at the top, very viscous, thick. Stas of the androdynamous fls inserted at the middle of the tube. Caps. equal

to the cal. A small pl. *P. Daonensis* Leyb.—Alp.; *G.* (Val Muranza, Wormserjoch). 6 . *oenensis* Thom. 1838.

8. *Ls* elliptic-oblong, entire (rarely slightly crenate), shortly ciliate. *P. Candolleana* Rchb.—Pasturages of the high Alp.; *G. T. O. U. A.* (no further westward!). 6

integrifolia L. 1839.

- *Ls* lanceolate-cuneiform, toothed at the top, glabr., vis-
cous.—Alp.; *G.* (Parpaner Rothhorn, Val d'Assa and
Pizlat in the lower Engadine). 6 . *glutinosa* Wulf. 1840.

OBS. Hybrids: *P. Auricula-hirsuta* (*P. pubescens* Jacq., *P. helvetica* Don., *P. rhætica* Gaud.); *P. Auricula-viscosa* (*P. alpina* Schl., *P. rhætica* Koch not Gaud. ex Kern.); *P. elatior-officinalis* (*P. media* Peterm.); *P. elatior-vulgaris* (digenea Kern.); *P. hirsuta-viscosa* (*P. Berninæ* Kern.); *P. hirsuta-integrifolia*; *P. integrifolia-viscosa* (*P. Muretiana* Moritzi, *P. Dinyana* Lagg.); *P. officinalis-vulgaris* (*P. brevistyla* Dec, *P. variabilis* Goup.); *P. suaveolens-vulgaris* (*P. ternoviana* Kern., 1869. *P. Schmidelyi* Grml. 1881).

475. *Hottonia. Hottonia.* V, 36.

1. *Ls* submerged, pectinate-pinnatifid, with linear seg-
ments. Fls whorled, rose-coloured.—Marshes of the Swiss
plateau; rare; *T. V. J. Z.* 5 . *palustris* L. 1841.

476. *Cortusa. Cortusa.* V, 36.

1. *Ls* cordate-orbicular, angular-lobed. Fls umbelled, rose-
coloured.—Alp.; *G.* (Lower Engadine). 5
Matthioli L. 1842.

477. *Soldanella. Soldanella.* V, 38.

1. Cor. cleft to about the middle, with 5 membranous
scales at the throat between the stas. Stem gen. 2—3-fld.
Ls orbicular-reniform.—Alp. and higher Jura. 6
alpina L. 1843.

- Cor. cleft to barely a third (rarely deeper), without
scales at the throat, or with very short scales. Stem
1-fld (rarely 2-fld) 2

2. *Ls* cordate-orbicular or orbicular-reniform. Cor. infundi-
buliform-campanulate, violet.—High Alp. (wanting in
V.). 7 *pusilla* Baumg. 1844.

- *Ls* (very small) orbicular, with no incision at the base.
Cor. (large in proportion) cylindric-campanulate, pale
lilac, streaked with dark violet inside.—High Alp.; in-
dicated in Graub. (Valserberg). 7 *minima* Hopp. 1845.

OBS. *R. alpina-pusilla* (hybrida Kern.) may also be found in Switz.

478. *Cyclamen. Cyclamen.* V, 39.

1. Throat of the cor. toothed. Fls scentless. *C. hederæ-*
folium auct. not Ait., *C. subhastatum* Rchb.—Stony,
thickety, calc. hills; V. (near Roche! St. Maurice?). 9
neapolitanum Ten. 1846.

- Throat of the cor. not toothed. Fls scented. C. coum. Rchb.—Stony, thickety places, especially of the mount. and subalp.; scattered (wanting in S.). 7
europæum L. 1847.

479. *Sámolus*. *Samole*. V, 15.

1. Ls oblong-obovate. Fls in racemes; peduncles with a bracteole in the middle (!).—Marshes; very rare; V. (Abbaye de Salaz in the Rhone-valley; Roche; formerly in other localities also). 6 *Valerandi* L. 1848.

82. Globulariaceæ.

480. *Globulária*. *Globularia*. IV, 20.

1. Stem bearing numerous ls. *G. vulgaris* auct. not L.—*b. elongata* Heg. Stem taller; caul. ls smaller, more distant (Graub.).—Pasturages, hills, gen. not uncommon (but wanting in U. L.). 4 *Willkommii* Nym. 1849.
- Stem leafless or with only 1—2 scales 2
2. Rt-stock producing decumbent, barren stolons. Fl.-stems 3—15 cm. Fls small.—Rock-debris of the Alp., subalp. and Jura; sometimes also lower. 6 *cordifolia* L. 1850.
- Rt-stock branchy, but without decumbent, barren stolons. Fl.-stems 10—20 cm. Ls almost as long as the stems.—Alp. and subalp. 5 *nudicaulis* L. 1851.

83. Plumbagineæ.

481. *Arméria*. *Thrift*. V, 140.

1. Ls linear, slightly broader towards the base, or equal in breadth, glabr. Outer invol.-ls obtuse, mucronate.—Marshy meadows near Constance (Wollmatinger-Ried opposite Gottlieben); lake-shores near Mammern; Sulger-Büel. 6 *rhenana* Grml. 1852. *)
- Ls narrow linear-lanceolate, rather narrowed towards the base, with glabr. or shortly rough-ciliate edges. Invol.-ls as in the last.—High Alp.; rare; G. T. A. (Piz Palu, Furca di Bosco, Gries-glacier, upper Sandalp). 7
alpina Willd. 1853.
- Ls linear-lanceolate, broader than in the last. Outer invol.-ls acuminate. Seed elongated.—Alp.; W. (only in the Val d'Evolena: Chenevard!). 7 *plantaginea* Willd. 1853b.

*) Differing from *A. purpurea* Koch (Memmingen-Ried, in Bavaria), which has also glabr. ls, only in its lower and more tufted growth, rather as in *A. alpina*. Taken for *A. alpina* by Koch.

84. Plantaginaceæ.

482. Plantago. Plantain. IV, 20.

1. Peduncles springing from the axils of the rad. ls which are in a rosette. Stem apparently 0 (much reduced) **2**
- Peduncles springing from the axils of the, opp., caul. ls; stem developed, simple or branchy . . . **9**
2. Ls oval or elliptic. (Peduncles cylindric) . . . **3**
- Ls lanceolate, linear-lanceolate, or linear . . . **4**
3. Ls with a fairly long petiole (at least half as long as the ls), erect-spreading. Peduncles erect or ascending, and, without the spike, as long or hardly longer than the ls. Filaments of the stas whitish.—b. *intermedia* Gil. (minima Dec., dwarf form). Ls thinner, softer, irreg. toothed, more or less hairy, as also the arched ascending peduncles; spikes shorter; seeds larger. (Geneva, Rolle, Porrentruy.)—Roads, grassy places; everywhere. **6**
major L. 1854.
- Ls contracted to a short, broad petiole (barely $\frac{1}{8}$ — $\frac{1}{4}$ as long as the ls), gen. pressed against the soil. Peduncles arched at the base, 4—5 times as long as the ls. Filaments of the stas light lilac.—As the last. **6**
media L. 1855.
4. Cor.-tube pubescent. Ls linear. (Peduncles cylindric) **5**
- Cor.-tube glabr. Ls lanceolate or linear-lanceolate **6**
5. Peduncles 5—15 cm. Spikes oblong-cylindric (in the high Alp. almost globular). Ls blackish when dried, sometimes (v. *incana*) shortly gray-pubescent.—Alp. and subalp., Dôle in the Jura. **7** . . . **alpina L. 1856.**
- Peduncles 15—30 cm. Spikes elongated (5—10 cm), linear-cylindric. Ls thicker than in the last, glaucous, not turning black when dried, sometimes ciliate (v. *aspera* Gaud.) or with lobe-like, prominent teeth (v. *bidentata* Murith?). Rt-stock very long (inde nomen!). P. *maritima* Koch p. (*serpentina* Koch = *carinata* Schrad.), P. *integralis* Gaud.—Uncultivated places, rare; G. T. W. V. O. (Upper Engadine; Bellinzona; Simplon, Nicolaital, St. Bernard; Geneva; Leuk). **7** **serpentina Vill. 1857.**
6. Peduncles more or less deeply furrowed. Seeds smooth **7**
- Peduncles cylindric. Seeds wrinkled . . . **8**
7. Rt-stock oblique, truncate. Peduncles deeply furrowed. b. *capitata* Ten. Spikes almost globular. Ls narrower, villous-woolly at the base.—Road-sides, dry pasturages; everywhere; b. T. W. O. **4** . . . **lanceolata L. 1858.**
- Rt-stock descending, branchy. Peduncles less deeply furrowed than in the last. Spikes oblong-cylindric, narrowed towards the top, villous-silken (but also varied

with a less dense villosity).—Lucern- and clover-fields, observed in 1874 in immense quantities near the railway station at Kreuzlingen, with Ammi, Centaurea solstitialis, Helminthia &c.; near Geneva. 7 . . . * *Lagopus* L. 1859.

8. *Ls glabr.* or with long scattered hairs. Spikes few-fl'd. Peduncles 8–12 *cm.*—Alp., subalp. and Jura. 7

montana Lam. 1860.

- *Ls* almost villous-silken, as also the peduncles. Spikes several-fl'd. Peduncles taller. Bracts larger.—Alp.; indicated at the baths of Louèche and at Zermatt. 7

fuscescens Jord. 1861. *)

- 9 (1). The 2 front cal.-segments obliquely spathulate, very obtuse. Stem herbaceous.—Sandy fields; Sésegin, Canton Geneva; in other places sometimes adventitious in lucern-fields. 6 *arenaria* W. K. 1862.

- The 2 front cal.-segments broad-oval, mucronate. Stem almost shrubby below. Uncultivated places, rare. V. Freibg., Monnetier. 6 *Cynops* L. 1863.

483. *Littorella*. *Littorel.* XXI, 33.

1. Rad. *ls* linear-subulate. Male fls solitary on a short peduncle; fem. fls 2–3 together, sessile at the base of the male peduncles.—Sandy and damp shores; here and there (wanting in G. U. L.). 5 *lacustris* L. 1864.

85. Amarantaceæ.

484. *Amarantus*. *Amarantus*. XXI, 35.

1. Perianth with 3 divisions. Stas 3. Fr. indehisc. Upper clusters forming a spike-shaped, leafless panicle. Stems decumbent or ascending. Comp. *Albersia* (Euxolus).
- Perianth with 3 divisions. Stas 3. Fr. opening circularly about the middle. Clusters all in the l.-axils. Stem erect, glabr. Like *Albersia* *Blitum*, but the *ls* are sub-obtuse at the top, not emarginate. A. *Blitum* Moq.—Rubbish-heaps, road-sides, rare; Wall., Vaud; Geneva, Freibg.; Bâle. 7 *sylvestris* Desf. 1865.
- Perianth with 5 divisions. Stas 5. Fr. opening circularly. Clusters forming a compact spike-shaped panicle. Stem erect, hairy.—As the last; G. T. V. W. J. Z., partly adventitious. 7 *retroflexus* L. 1866.

*) But, according to Decn., *P. montana holosericea* Gaud. = *P. argentea* Chaix. (*Victorialis* Poir.).

485. *Albérzia*. *Albersia*. XXI, 35.

1. Stem glabr. Ls gen. incised at the top. *Euxolus viridis* Moq.—Rubbish-heaps, road-sides; everywhere. 7
Blitum Kunth. 1867.
- Stem hairy above. Ls subacute or subobtuse, rarely incised at the top.—On walls; V. (Carouge). 7
deflexa Gren. 1868.

486. *Polycnémum*. *Polycnemunum*. III, 6.

1. Bracts shorter than the perianth, or scarcely as long. Fr. scarcely 1 mm long.—Fields and stubble, not common. Aubonne! Other localities remain to be verified on account of the confusion with the following. 7 *arvense* L. 1869.
- Bracts longer than the perianth. Fr. nearly 2 mm long. Pl. more robust in every way, with thicker, stiffer branches.—As the last; W. V. Bâle (St. Louis), Diessenhofen, Schaffh. 7 *majus* A. Br. 1870.

86. *Chenopodiaceæ*.487. *Chenopódium*. *Goosefoot*. V, 133.

1. Ls pubescent-glandular, not powdery, sinuate-pinnatifid.—Rubbish-heaps and road-sides in warm parts, especially G. T. W., sometimes adventitious in other places. 7 *Botrys* L. 1871.
- Ls not glandular and glabr. (without hairs), but often, especially when young, powdery through the effect of small, gen. sessile papillæ 2
2. Stigs elongated. Seeds all vertical. Pl. perenn. Ls triangular-hastate, with entire and rather wavy edges, rarely (v. *dentatum*) deeply sinuate-dentate. *Blitum Bonus Henricus* Rehb.—Rubbish-heaps, road-sides; everywhere. 5
Bonus Henricus L. 1872.
- Stigs short. Seeds all horizontal or at least the terminal seed of the cluster (there are vertical seeds in 1880 and 1881, gen. with a 2—3-fid perianth and 1—3 stas). Ann. pl. 3
3. Ls cordate at the base, large, deeply sinuate-angular, gen. with 2—4 large teeth on each side, and acuminate with a long point.—As the last; fairly distrib. 7
hybridum L. 1873.
- Ls with the base narrowed to a petiole 4
4. Ls entire 5
- Ls sinuate-dentate, or incised, rarely entire in *C. album* 6
5. Ls not powdery, oval or oval-oblong. Fr. not covered by the perianth. Clusters arranged sometimes more in

the form of a spike (v. *acutifolium*), sometimes more in the form of a cyme (v. *cymosum*).—Fields, rubbish-heaps; distrib. 7 . . . **polyspermum** L. 1874.

- Ls powdery, oval-rhomboidal. Fr. covered by the perianth. Pl. very foetid.—Between the pavements and on manured ground in warm parts (wanting in U. L. A.). 7 **Vulvaria** L. 1875.

6. Fl.-axes and perianth powdery 7

- Fl.-axes and perianth not powdery 9

7. Seeds dull, with sharp edges. Ls of a dull green, slightly shiny, not very powdery underneath, with unequal, deep and acute teeth.—Rubbish-heaps and road-sides; fairly distrib. 7 **murale** L. 1876.

- Seeds shining, with rather obtuse edges. Ls dull, more or less powdery underneath, unequally angular-toothed 8

8. Lower and middle ls orbicular-rhomboidal or oval-rhomboidal, about as broad as long, often rather 3-lobed, obtuse, the upper narrower, but at the same time broader than in 1878.—As the last, rare; Vallée de la Viège, Sion, Branson, Bâle, Kreuzlingen, Chur. 7

opulifolium Schrad. 1877.

- Lower and middle ls oval-rhomboidal or almost oval-lanceolate, distinctly longer than broad, acute. the upper, rarely all (v. *lanceolatum*) oblong-lanceolate, with almost entire edges — Varied: Clusters sometimes arranged more in the form of a pyramidal spike (v. *spicatum*), sometimes more in a corymb-shaped panicle and then the ls more often green (v. *cymigerum*).—As the last; everywhere. 7 **album** L. 1878.

- Lower and middle ls considerably longer than broad, almost hastate—3-lobed, the middle lobe elongated. Style rather more distinctly spotted than in the 2 last.—As the last, rare; lower Rhone-valley (Sion, Colombey, Bouveret, Collonges); Constance; Sargans. 8

ficifolium Sm. 1879.

9 (6). Ls two-coloured, whitish gray underneath, oblong, sinuate-dentate.—As the last; local; W. V. O. B. J. A. 7

glaucum L. 1880.

- Ls con-coloured or slightly mealy underneath, triangular or rhomboidal 10

10. Full-grown ls not mealy (shining, often red), rhomboidal-triangular, almost hastate—3-lobed, deeply sinuate-dentate. Lateral spikes with small ls. Seeds small, reddish brown, some, at least, vertical. Like *Blitum virgatum*.—As before; G. W. V. U. Z. A. 7 **rubrum** L. 1881.

- Ls faintly powdery, triangular-rhomboidal, narrowed to the petiole, sinuate-dentate. Lateral spikes almost leaf-

less. Seeds larger, blackish brown, all horizontal. Like *C. murale*.—As the last, rather rare; W.? V. B. J. Z. 7
Intermedium M. K. 1882.*)

488. *Blitum*. *Blitum*. I, 5. V, 133.

1. Clusters of fls all in the l.-axils. (Stem leafy up to the top.)—Uncultivated, stony places; G. W. U. A.; sometimes adventitious in other parts. 6 ***virgatum* L. 1883.**
- Only the lower clusters in the l.-axils, the upper leafless.—Rubbish-heaps and road-sides; adventitious and variable. 6 * ***capitatum* L. 1884.**

489. *Atriplex*. *Orache*. XXI, 35.

1. Fem. fls (on the same pl.) of various forms; some with 3—5-partite perianth and the seed horizontal without bracts; but most without a perianth, with 2 bracts and vertical seeds. Fr.—bracts oval-orbicular, entire.—Sometimes subsponaneous on rubbish-heaps and way-sides; more often cultivated. 7 † ***hortensis* L. 1885.**
- Fem. fls all of the same form, all without perianth, with 2 bracts and vertical seeds 2
2. Lower and middle ls lanceolate, or oblong-lanceolate, narrowed to a short petiole, the lower often hastate. Fr.—bracts hastate-rhomboidal, larger than the fr. or (v. *erectum* Huds.) only as large as the fr. and at the same time denticulate-tubercular on the back. *A. angustifolia* Sm.—Uncultivated places, fallow; distrib. 7, 8
***patula* L. 1886.**
- Ls broader than in the last, the lower and middle ones hastate-triangular, the base truncate almost in a straight line, and the petiole longer. Fr.—bracts almost triangular. *A. latifolium* Wahl.—As the last, but very rare and probably adventitious (Morges, Auenstein &c.) Z. T. 8
***hastatum* L. 1887.**

OBS. To this family also belong: the genus *Spinacia*, spinach, of which 2 species are cultivated, viz.: *S. glabra* Mill. (*inermis* Mönch) and *S. oleracea* L. (*spinosa* Mönch); also *Beta vulgaris* L. of which 2 principal forms are cultivated, viz.: *B. vulgaris Cicla*, common Beet, with a (relatively) thin root, and *B. vulgaris rapacea*, Beetroot, with a thick root projecting above the soil.

87. Phytolacaceæ.

490. *Phytolacca*. *Phytolacca*. X, 1.

1. Stem 10—20 dm. Ls oval-lanceolate, with entire edges. Fls in racemes, red. Berries black.—Road-sides and hedges; naturalised in transalpine Switz. 7
***decandra* L. 1888.**

*) The true *C. urbicum* L. which differs in its almost triangular ls with the base cut almost in a straight line, and its shorter teeth, appears to be wanting with us.

88. Polygonaceæ.

491. *Rumex*. Dock. VI, 37. XXII, 28.

1. Ls hastate or sagittate (with an acid flavour); in *R. nivalis* scarcely hastate, but fls diœcious (false whorls without ls) 2
- Ls neither hastate nor sagittate. Fls gen. hermaphrodite, rarely polygamous 6
2. Fls polygamous (hermaphr. and male fls on the same pl.). Ls about as broad as long, gen. glaucous. *R. glaucus* Jacq. (a robust, very glaucous form).—Stony places and detritus on the Alp., subalp. and Jura, also, through former cultivation, on walls at a lower elevation. 6
- *scutatus* L. 1889.
- Fls diœcious 3
3. Inner divisions of the fr.-perianth thick-scarious, indistinctly net-veined, not larger than the fr., with no callosity; outer divisions of the perianth erect-applied. Stem 5—30 cm.—Fallow, wood-clearings, peat-mosses; distrib. 5 *Acetosella* L. 1890.
- Inner divisions of the fr.-perianth membranous, thin, strongly net-veined, much larger than the fr., with a short callosity at the base; outer divisions of the perianth reflexed 4
4. Stem 5—10 cm, leafless or with 1—2 ls. Ls rather thick, with obtuse or indistinct auricles.—Detritus on the high Alp., on limestone; eastern Switz. and O. 8
- *nivalis* Heg. 1891.
- Stem 30—90 cm, leafy. Ls with distinct auricles 5
5. Ls thin, distinctly nerved, the lower obtuse. Auricles spreading outwards. L.-sheaths entire, short.—Alp., subalp. and Jura. 7 *arifolius* All. 1892.
- Ls rather thick, with less distinct nerves, acute. Auricles directed downwards (almost parallel to the petiole). L.-sheaths laciniate, longer than in the last.—Meadows, pasturages; everywhere. 5 *Acetosa* L. 1893.
- 6 (1). Inner divisions of the perianth distinctly toothed 7
- Inner divisions of the perianth entire or with unapparent teeth 11
7. Ann. or bienn. pls. Ls all, the lower also, narrowed to the petiole. (False whorls many-fld, all supported by ls) 8
- Perenn. pls. Lower ls with rounded or cordate base 9
8. Teeth of the inner divisions of the perianth setaceous, longer than the breadth of the divisions. Upper false-whorls confluent. Ls linear-lanceolate. Pl. tinted with golden yellow when mature.—Marshes, edges of ponds;

Egelsee, Canton Schaffh. (formerly at least), Bonfol? Rheinfelden? Oberentfelden, Aargau? 7

maritimus L. 1894.

- Teeth of the inner divisions of the perianth subulate, shorter or scarcely as long as the breadth of the divisions. False-whorls separated from one another. Ls long-lanceolate. Pl. of a dirty greenish yellow when mature, taller than the last. *R. conglomeratus-maritimus* auct.—As the last; indicated near Rheinfelden; Bregenz. 7

**palustris* Sm. 1895.

- 9. Branches divergent. False whorls distant from one another, each, except the last, supported by a small l. Inner divisions of the perianth bordered on each side by 6—8 almost spiny teeth.—Uncultivated places and way-sides; T. W. V. 6 *pulcher* L. 1896.

- Branches erect-ascending. False whorls without ls or only the lower ones supported by a leaf 10

- 10. Inner divisions of the perianth triangular-oval (5 mm long), prolonged at the top in an entire lobe, and bordered below by 2—4 triangular or triangular-subulate teeth on each side. Rad. ls cordate-oblong, obtuse or subacute.—Meadows, road-sides; everywhere. 7

obtusifolius L. 1897.

- Inner divisions of the perianth broader than in the last, obtusely triangular at the top, less prolonged; teeth more numerous, shorter. Rad. ls longer, narrower and more acute. *R. crispus-obtusifolius*.—As the last, but rare. 7 **pratensis* M. K. 1898.

- 11 (6). Inner divisions of the perianth (small) linear-oblong, almost twice as long as broad, obtuse. False fr.-whorls distant 12

- Inner divisions of the perianth (larger) oval-triangular, cordate-rounded or suborbicular, as broad or almost as broad as long. False fr.-whorls more or less crowded 13

- 12. False whorls leafy, except the highest. Inner divisions of the perianth gen. all with a callosity. Pedicels jointed a little below the middle. Branches arched-ascending. Ditches, shores, damp thickets; everywhere. 7

conglomeratus Murr. 1899.

- False whorls all leafless, or only the lower supported by a leaf. Gen. only one of the inner divisions of the perianth with a callosity. Pedicels jointed close to the base. Branches erect-spreading. *R. sanguineus* Koch.—Woods, damp thickets; probably distrib. (wanting in G. T. U.); the form with the stems and nerves of the ls blood-red; Vaud. 7 *nemosus* Schrad. 1900.

13. Inner divisions of the perianth all, or at least one, with a callosity **14**
 — Inner divisions of the perianth all without the callosity **16**
 14. Inner divisions of the perianth triangular-oval, all with a callosity. Stem 10—20 *dm.* Ls very large, oblong-lanceolate, narrowed at the base.—Marshes, shores; not common. W. V. J. Z. S. 7 . . . **Hydrolápathum L. 1901.**
 — Inner divisions of the perianth suborbicular or cordate-orbicular **15**
 15. Ls rather thick, with wavy-crisp edges, lanceolate or oblong-lanceolate. Inner divisions of the perianth all with a callosity, but 2 of the callosities often smaller or indistinct.—Damp meadows, ditches; everywhere. 7 **crispus L. 1902.**
 — Ls thinner and larger than in the last, the edges not, or only slightly, crisp, oval-lanceolate. Only one of the inner divisions of the perianth with a callosity.—Old walls and ruins, rarely naturalised (Sion, Aarburg, Wildegg). 7 **Patientia L. 1903.**
 16 (13). Ls very large, cordate-oval, acute, broader towards the base, almost triangular. Stem 10—15 *dm.* R. Hippolapathum Fr.—Shores, ditches, rare; Neuchâtel, Solothurn, Zürich, Schaffh. 8 . . . **aquaticus L. 1904.**
 — Ls large, cordate-suborbicular, rounded-obtuse or shortly acuminate on the obtuse apex. Stem 5—10 *dm.*—Alp. and subalp., by preference near chalets; wanting on the Jura. 8 **alpinus L. 1905.**

OBS. Hybrids: *R. crispus-nemorosus* on the Eschenberg and *R. conglomeratus-crispus* near Walkenweiler (both according to Siegfried). *R. alpinus-obtusifolius*, Enzeindaz and Pilatus (according to Haussknecht).

492. *Oxyria*. Mountain-sorrel. VI, 37.

1. Ls reniform, emarginate at the top, almost all radical. —Detritus of the high Alp. 7 . . . **digyna Hill. 1906.**

493. *Polygonum*. Knot-grass. VIII, 13, 22. V, 60, 132, 142. VI, 36.

1. Ls cordate-sagittate **2**
 — Ls not cordate-sagittate **5**
 2. Stem erect. Fr. surrounded by the perianth only at the base **3**
 — Stem winding. Fr. surrounded by the perianth . . . **4**
 3 Fls rose or white. Corners of the fr. entire. *Fagopyrum esculentum* Mönch. 7 † **Fagopyrum L. 1907.**
 — Fls greenish, smaller than in the last. Fr. with sinuate-dentate corners.—With the last, introduced and sometimes subsponaneous. 7 † **tataricum L. 1908.**

4. Pedicels jointed near to the perianth; outer divisions of the perianth obtusely keeled. Stem 5—15 *dm.*—Fields after mowing, market-gardens; distrib 7
Convolvulus L. 1909.
- Pedicels jointed below the middle. Outer divisions of the perianth with a winged-membranous keel (wings 2—3 *mm* broad). Stem 10—20 *dm.*—Hedges, damp thickets; distrib. but not common. 7 . . . **dumetorum L. 1910.**
- 5 (1). Fl.-clusters separate in the axils of ordinary leaves (sometimes rather reduced towards the top). Stem gen. very branchy with prostrate, rarely (v. *erectum* Roth.) erect ramifications. *P. microspermum* Jord. (a delicate narrow-leaved sand form: Geneva!).—Road-sides, rubbish-heaps: everywhere. 6 . . . **aviculare L. 1911.**
- Fl.-clusters crowded in the axils of (reduced) bracts, forming a false spike or a raceme, or only the lower ones rather distant in the axils of ordinary small ls 6
6. Fls yellowish white in paniculate false racemes.—Meadows; G. T. W. O. U. (in immense quantities in the trans-alpine valleys). 7 . . . **alpinum L. 1912.**
- Fls in false spikes . . . 7
7. Stems lateral, terminated by a single (rarely 2 in *P. Bistorta*) spike. Styles 3, separate; stigs small . . . 8
- Stems terminal, bearing several spikes (in *P. amphibium* only 3—1). Styles 2—3, slightly united; stigs large 9
8. Lower ls oblong-oval, cordate at the base, with a winged petiole. Fls flesh-coloured.—Damp meadows, in patches, especially in the valleys of the mount. 5 **Bistorta L. 1913.**
- Ls all elliptic-lanceolate, contracted to the petiole, rolled at the edges. Petioles not winged. Fls white, gen. intermixed with little bulbs.—Alp., subalp. and Jura. 6
viviparum L. 1914.
9. Perenn. pls with creeping rt-stock Ls with long petioles, floating, in the land form (v. *terrestre*) with shorter petioles, narrower and rough, with short hairs.—Ponds, ditches; the variety at the edges of ditches and fields; distrib. 7 . . . **amphibium L. 1915.**
- Ann. pls, with a fusiform-fibrous rt. Ls shortly petioled or sessile . . . 10
10. Spikes oblong-cylindric, compact, erect, or, the lateral especially, rather laxer and slightly drooping . . . 11
- Spikes linear-filiform, slender, lax, interrupted at the base, drooping, rarely (in 1920) almost erect . . . 12
11. Common peduncles more or less glandular. Sheaths lying looser on the stem, with short fine ciliæ. Ls spotted (often glandular) underneath. *P. tomentosum* Schrank.—Var.: with fls of a greenish white, and rose (as in *P. Persicaria*), the ls gray-tomentose underneath (v. *incanum*),

and the stem tall with thick nodes, and slender spikes (v. *nodosum* Pers.? *); also b. *punctatum* Grm! Ls spotted underneath as also the perianth with numerous golden glands.—Ditches, manure-heaps, village streets; b. Kreuzlingen, Lugano. 7—9 . . . *lapathifolium* L. 1916.

- Common peduncles without, or with very scattered, glands. Sheaths closely applied, with long stiff ciliæ. Ls not spotted underneath.—As the last; everywhere. 7—9

Persicaria L. 1917.

12. Perianth with 3—4 divisions, covered with numerous shining glands. Pl. with a sharp peppery flavour. Sheaths, especially the upper, shortly ciliate.—Ditches, damp wooded places; distrib. 7 . . . *Hydropiper* L. 1918.

- Perianth gen. with 5 divisions, not glandular, or only with indistinct glands at the base. Pl. with a herby flavour. Sheaths long-ciliate 13

13. Ls oblong-lanceolate, narrowed at both ends (the greatest breadth about the middle), veined. Spikes drooping.—Ditches, river banks; distrib. 7, 8

mite Schrank. 1919.

- Ls narrower than in the last, rounded at the base or hardly narrowed, then of equal breadth as far as the middle, narrowed insensibly and almost in a straight line from there to the top, indistinctly veined.—Ditches, damp fields; local (wanting in S.). 7 minus Huds. 1920.

OBS. *P. Persicaria* and the allied species produce hybrids which are difficult to determine and require further examination as regards Switzerland. Wilms professes to have found near Geneva: *P. lapathifolium-Persicaria*, Papon near Villeneuve: *P. Hydropiper-Persicaria*. *P. Hydropiper-mite* according to Siegfried. *P. Bistorta-viviparum* Br. near Chur.

89. Thymeleaceæ.

494. *Passerina*. *Passerina*. VIII, 14.

1. Fls greenish, in long leafy spikes. Ls linear-lanceolate. Fields, fallow; not rare (wanting in T.). 7

annua Wikstr. 1921.

495. *Daphne*. *Daphne*. VIII, 14.

1. Fls (before the ls) gen. 3 together, sessile in the axils of the ls (now fallen) of the past year, rose-coloured, rarely white (and then the berries yellow?).—Woods, up to 2200 m, in rocky places of the Alp.: Jaccard; distrib. 3 *Mezérium* L. 1922.

*) We do not know another *P. nodosum* Meissn. Aschers., which differs from this in having the common peduncles without, or almost without, glands. Can this be *P. lapathifolium* Heg.? *incanum* Gaud.? See N. Beitr. III, 23.

- Fls in short racemes, drooping, in the l.-axils, yellowish green. Ls persist., leathery.—Mountain woods, especially in the Jura (wanting in G. O. S. A.) and W. above St. Maurice. 2, 3 . . . **Laureola L. 1923.**
- Fls in terminal, umbel-shaped fascicles, white or rose-coloured **2**
- 2. Ls soft, oblong-obovate, hairy when young. Perianth white, villous.—Alp., subalp. and Jura (wanting in U. A.) 4 **alpina L. 1924.**
- Ls leathery, linear-cuneiform, always glabr. Perianth rose-coloured **3**
- 3. Perianth glabr.—Limestone Alp.; G. T. U. A. (wanting in the eastern Alp.). 6 **striata Tratt. 1925.**
- Perianth hairy.—Jura (Marchairuz to Eglisau); Tess. (Mt. Salvadore). 6 **Cnéorum L. 1926.**

90. Laurineæ.

496. **Laurus.** Bay. IX, 1. XXII, 14.

1. Ls oblong-lanceolate, leathery, persistent. Fls greenish, in fascicled umbels placed in the l.-axils.—Often cultivated in gardens near the lake of Geneva; subspon-taneous, it is said, in Tess. (near Gandria). 4
† **nobilis L. 1927.**

91. Santalaceæ.

497. **Thesium.** Thesium. V, 57. IV, 26.

1. Below each fl. 1 bract. Stem terminated by a tuft of ls without fls.—Pasturages, rare; G. Zürich, Schaffh., Thurgau (Mammern). 6 **rostratum M. K. 1928. *)**
- Below each fl. 3 bracts. Stem bearing fls up to the top **2**
2. Perianth, after flowering, only rolled up at the top and then equal to or longer than the fr. **3**
- Perianth, after flowering, rolled up almost to the base and then only $\frac{1}{3}$ as long as the fr. **5**
3. Fr.-bearing branchlets spreading almost horizontally, gen. in every direction (the axis bent in a zigzag). Stem 15—30 cm.—Pasturages, especially of the mount. and subalp. 6 **pratense Ehrh. 1929.**
- Fr.-bearing branchlets erect-spreading **4**
4. Stem 15—30 cm, almost erect, gen. terminated by a panicle; panicle lax, not unilateral.—Schwyz, Zürich, Winterthur, Chur. (Valley-form of T. alpinum?)
tenuifolium Saut. 1930.

*) A form with smaller fls and longer styles: **Th. Heerii Muret** in Grml. Excl. 3rd ed. 332: Jäggi, Schröter.

- Stem 10—15 *cm*, decumbent-ascending, terminated by a simple raceme; raceme rather dense, unilateral.—Pasturages of the Alp., subalp. and Jura, also lower. 6
alpinum L. 1931.
- 5 (2). Ls dark bluish-green, lanceolate or linear-lanceolate, acuminate. Rt-stock descending, branchy. Stem 40—80 *cm*.—Thickety hills, wood-sides; G. T. J. Z. S. 7
montanum Ehrh. 1932.
- Ls yellowish green, rather firmer than in the last, linear-lanceolate or linear, acute. Rt-stock emitting brittle, knotty stolons. Stem 15—30 *cm*.—As the last, rare; G. W. V. J. U. Z. ? 6 . . . *intermedium* Schrad. 1933.

92. Eleagnaceæ.

498. Hippophaë. Hippophae. XXII, 14.

1. Ls linear-lanceolate, silvery white and sprinkled with reddish scales underneath. A spiny shrub.—River beds; local (wanting in L.). 4 . . . *ramnoides* L. 1934.

93. Aristolochiaceæ.

499. Aristolochia. Aristolochia. XX, 1.

1. Fls fascicled, much shorter than the ls which support them.—Stony waste places, hedges, vineyards, not common (wanting in J. ? U. L.). 5 . . . *Clematitis* L. 1935.
- Fls solitary, longer than the ls which support them.—T. (Lugano). 4 . . . *rotunda* L. 1936.

500. Asarum. Asarum. XI, 6.

1. 2 orbicular-reniform ls, with long petioles, and between these 2 ls 1 solitary fl., shortly peduncled and drooping. Perianth blackish purple inside.—Woods, thickets; distrib. 4 . . . *europæum* L. 1937.

94. Empetraceæ.

501. Empetrum. Empetrum. XXII, 11.

1. Ls linear, rolled at the edges (acicular). Fls solitary in the l.-axils, rose, rarely white.—High Alp. and Jura (Creux du Van, vallée de Joux, &c.). 5, 6 *nigrum* L. 1938.

95. Euphorbiaceæ.

502. **Buxus.** Box. XXI, 15.

1. Ls opp., elliptic, leathery, persistent (the upper and lower layer of their tissue easily separating!).—Thickety hills, especially in the Jura (wanting in U. L. S. A.); everywhere in gardens. 4 . . . **sempervirens** L. 1939.

503. **Euphórbia. Spurge.** XI, 6. XXI, 25.

1. Ls opp. in the form of a cross. Caps. large. Stem 50 to 100 cm.—Uncultivated places, road-sides; T. W. V., probably subspontaneous. 6 **Lathyris L. 1940.**
- Ls alternate 2
2. Glands (of the calyx-like invol.) orbicular, or transverse oval 3
- Glands crescent-shaped, the points sometimes long. (Ls entire) 9
3. Seed pitted. Ls obovate, narrowed to the petiole, denticulate towards the top. Capsule smooth.—Cultivated places; market-gardens; everywhere. 5 **Helioscopia L. 1941.**
- Seeds smooth 4
4. Caps. smooth or only finely spotted. Ls rather firm, glaucous, linear-lanceolate, the edges quite entire, glabr. Umbels with numerous rays.—Uncultivated stony places, near water; W. V. L. Z. S. 6 **Gerardiana Jacq. 1942.**
- Caps. with distinct tubercles. Ls gen. denticulate towards the top 5
5. Glands blackish red, rarely (v. chloradenia Boiss.) greenish. Rt-stock horizontal, fleshy, articulate-dentate. Ls of the involucels triangular-oval, truncate at the base. E. alpingena Kern.!—Woods; distrib. 5 **dulcis L. 1943.***
- Glands wax- or brownish-yellow 6
6. Umbels with 5—many rays; terminal umbel often exceeded by the lateral flowerless branches. Ls glabr. Stem 80—150 cm.—Marshes, river-banks; T. W. V. J. Z. 6 **palustris L. 1944.**
- Umbels with 3—5 rays. Ls glabr. or more often hairy. Stem 30—60 cm 7
7. Perenn. pls with numerous stems, spreading in a circle or ascending. Leaflets of the involucels elliptic, narrowed or rounded at the base, at last gen. yellow tinted with red.—Dry hills, road-sides; not everywhere. T. 5 **verrucosa Lam. 1945.**
- Ann. or bienn. pls. Stems erect or ascending-erect. Ls of the involucels almost triangular-oval, truncate at the base 8

*) Our form with glabr. capsules = *E. purpurata* Thuill. The typical form with hairy capsules and thick jointed rt-stock appears to be wanting in Switzerland.

8. Caps. 3—4 *mm* broad, covered with short, almost hemispheric tubercles. Umbels with 5 (rarely 3 or 4) rays. Road-sides, ditches, fields; not everywhere (wanting in U. L.). 7 **platyphylla** L. 1946.
- Caps. 2 *mm* broad, covered with shortly cylindric tubercles, longer than in the last. Umbels with 3 (rarely 4 or 5) rays. Stem slenderer, ls thinner, seeds smaller. —As the last; distrib. but earlier . . . **stricta** L. 1947.
- 9 (2). Perenn. pls with many-stemmed or creeping rt-stock. Umbels with numerous rays. Seed smooth **10**
- Ann. pls. Umbels with 3—5 rays. Seeds pitted or tubercular **12**
10. Involucel-ls united in pairs at the base, only leaving 2 lateral incisions. Ls hairy. Stem leafless below, with crowded ls about the middle and smaller, more distant ls above.—Woods, slopes; not rare (wanting in U. L.). 5
amygdaloides L. 1948.
- Involucel-ls free. Ls glabr. **11**
11. Ls linear (2—3 *mm* broad), those of the branches very narrow (1 *mm*).—Gravelly places, road-sides, river banks; everywhere. 5 **Cyparissias** L. 1949.
- Ls linear-lanceolate, broader than in the last, those of the branches almost of the same form.—Aarburg, Hütten-see, Canton Zürich. 5 * **virgata** W. K. 1950.
- 12 (9). Carpels of the caps. with 2 narrow wings on the back. Ls petioled, obovate, very obtuse, entire.—Cultivated ground, market-gardens; everywhere. 6 **Peplus** L. 1951.
- Carps without wings on the back **13**
13. Involucel-ls linear, broader at the base. Ls linear. Seed tubercular.—Fields, especially after mowing; distrib. 5, 6
exigua L. 1952.
- Involucel-ls obliquely oval or half-orbicular **14**
14. Glands with short points. Seeds marked with little pits arranged in rows. Ls obovate-lanceolate, the upper with a prickly point.—Fields; W. V. J. Z. (mostly in western Switz.). 6 **falcata** L. 1953.
- Glands with long points. Seeds irreg. netted with pits. Ls linear or linear-lanceolate, acuminate.—Fields; formerly near Sierre in Wall. and recently found near Yvorne. 6
 * **segetalis** L. 1954.

504. **Mercurialis**. Mercury. XXII, 29.

1. Perenn. pls; rt-stock creeping. Stem simple, leafless below.—Woods and thickets; distrib. 4 **perennis** L. 1955.
- Ann. pls; rt. fusiform. Stem branchy, leafy all over.—Market-gardens, rubbish-heaps; distrib., but at the same time only local in central Switz. 5, 6 **annua** L. 1956.

96. Urticaceæ.

505. *Urtica*. Nettle. XXI, 34. XXII, 30.

1. Pl. 15—30 *cm*, ann., monœcious (male and fem. fls on the same raceme). Ls oval, acute, inciso-dentate.—On walls, rubbish-heaps, near dwellings; almost everywhere. 6
urens L. 1957.
- Pl. of 60—100 *cm*, perenn., gen. dicœcious. Ls oval, acuminate, cordate at the base, coarsely toothed. *U. hispida* Cariot (see N. Beitr. I, 21).—Hedges, road-sides; everywhere. 6, 7 *dioica* L. 1958.

506. *Parietaria*. Pellitory. IV, 29.

1. Perianth of the staminiferous fls as long as the stas. Ls elliptic-lanceolate, acuminate. Stem erect, gen. simple or not much branched. *P. erecta* M. K.—Walls, rubbish-heaps; here and there (wanting in L. S.). 6
officinalis L. 1959.
- Perianth of the staminiferous fls elongated at last and as long again as the stas. Ls smaller, shorter and broader. Stem decumbent, gen. very branchy. *P. diffusa* M. K.—Walls, transalpine Switz; Fort de l'Ecluse, not far from Geneva. 7 *ramiflora* Mönch. 1960.

506*. *Cannabis*. Hemp. XXII, 29.

1. Male fls in a lax panicle; fem. fls in clusters. 7
† *sativa* L. 1961.

507. *Húmulus*. Hop. XXII, 20.

1. Ls heart-shaped at the base, palmati-lobed, with 3—5 lobes, the upper also undiv., the surface rough-lumpy. Stem twining to the right (*i. e.* as the hands of a clock).—Hedges, thickets; distrib. 7 *Lúpulus* L. 1962.

508. *Ulmus*. Elm. V, 128. IV, 6. VIII, 15.

1. Fls with long pedicels, fascicled, pendent. Fr. long and softly ciliate at the edges. Ls soft-pubescent underneath.—Woods, rare; Bâle, Freudenthal, Canton Schaffh., Lägern, Canton Aargau. 3 *effusa* Willd 1963.
- Fls with short pedicels, or almost sessile. Clustered, not pendent. Fr. glabr. Type of *U. campestris* 2
2. Seed placed immediately below the incision of the fr. Ls acute or short acuminate, doubly crenate-dentate, glabr. or almost glabr. above, tufted below in the axils of the nerves, otherwise almost glabr. Stas gen. 3—4. *U. suberosa* Ehrh. (branches with corky wings on the bark).—Woods, the localities need verifying on account of confusion with the following! 3 *glabra* Mill. 1964.

- Seed some distance from the incision, placed about the middle of the fr. Ls larger than in the last (12—15 cm), more or less long and suddenly acuminate, doubly toothed, the double teeth bent in the form of a sickle, rough above, more or less short-pubescent underneath. Stas gen. 5—6. U. major Sm.—As the last, apparently commoner. 3; rather earlier. . . . **montana With. 1965.**

509. Celtis. Celtis. V, 128.

1. Ls oblong-lanceolate, acuminate, toothed. Fls solitary in the l.-axils.—Transalpine Switz.; Simplon (Gondo). 3,4
australis L. 1966.

510. **Morus.** Mulberry. XXI, 16.

1. False berries whitish, sometimes tinted with red on one side, with a sweet insipid flavour. Ls soft; with only one principal ramification from the base of the middle nerve on each side. 5 † *alba* L. 1967.
- False berries black, larger, with a sweet-acid flavour. Ls harder, with 2 principal ramifications on each side from the base of the middle nerve. 5 † *nigra* L. 1968.

511. **Ficus.** Fig. XXI, 16.

1. Ls heart-shaped at the base, palmatilobed or undiv., rough.—Rocky places; W. T. at least subsponaneous. 4
Cárica L. 1969.

97. Platanaceæ.

512. **Plátanus. Plane. XXI, 16.**

1. Branches fairly erect. Ls pentagonal, indistinctly lobed, covered underneath with a gen. persistent pubescence, the base gen. cordate or truncate, never cuneiform.— An ornamental tree originally from N.America. 5
 — † **occidentalis** L. 1970.
 — Branches spreading. Ls deeply 5-lobed or 5-fid, the lobes acute or acuminate, often slightly toothed, becoming glabr. underneath, the base cuneiform or (b. *acerifolia* Willd.) truncate or slightly cordate.— An ornamental tree originally from the East. † **orientalis** L. 1971.

98. Juglandeæ.

513. **Juglans. Walnut. XXI, 6.**

1. Leaflets 5–9 (gen. 7), oblong or oblong-oval, acute or acuminate, almost entire.—Cultivated. 5 † regia L. 1972.

99. Fagineæ (Quercineæ).

514. *Fagus*. Beech. XXI, 12.

1. Ls elliptic-oval, feebly sinuate, villous-ciliate at the edges. — Woods, up to 1500 m. 4 . . . *sylvatica* L. 1973.

515. *Castanea*. Spanish chestnut. XXI, 13.

1. Ls oblong-lanceolate, toothed with cuspidate teeth, leathery, glabr. — Transalpine Switz. where this tree constitutes the forests; rarer on this side of the Alps. 5
sativa Mill. 1974.

516. *Quercus*. Oak. XXI, 14.

1. Stigs yellow. Scales of the cup long, linear-subulate, spreading, twisted. — Woods of the mount.; Tess. 4
Cerris L. 1975.
- Stigs red. Scales of the cup short, appressed, imbricate. Type of *G. Robur* L. 2
2. Ls irreg. sinuate-lobed, 2-lobed-cordate at the base, very shortly petioled. Fr. scattered at the end of a long peduncle. — Woods, 4, 5 *pedunculata* Ehrh. 1976.
- Ls more deeply and more reg. lobed than in the last, more keel-shaped at the base, with longer petioles. Fr. more or less crowded on a short peduncle . . . 3
3. Lower face of the ls, as also the branches of the present year, glabr. or only slightly pubescent when young. The var. *subfastigiata* Deb., according to Christ, in Tess. — Woods, but gen. less common than the last. 4, 5, rather later *sessiliflora* Salisb. 1977.
- Lower face of the ls, as also the branches of the year, gray-tomentose, later pubescent. A low knotty tree or shrub. — Dry hills; southern and eastern Switz., Graub., Schaffh. 4, 5 *pubescens* Willd. 1978.

100. Carpineæ.

517. *Corylus*. Hazel. XXI, 14.

1. Ls orbicular or orbicular-obovate, heart-shaped at the base, acuminate, double-toothed, sometimes with small lobes towards the top. — b. *glandulosa* Shuttlw. Fr. more globular, hardly compressed; fr.-invol. with numerous glands at the base. — Woods and thickets; everywhere; b. in the Jura, Château d'Oex, Chur. 2, 3 *Avellana* L. 1979.

518. *Carpinus*. Hornbeam. XXI, 11.

1. Ls oval-oblong, double-toothed, oblique when young, folded transversely. — Woods; distrib. 5 *Bétulus* L. 1980.

519. *Ostrya*. *Ostrya*. XXI, 11.

1. Ls oval, acuminate, feebly cordate at the base, double-toothed.—Tess., Graub., Misox (above Grono: Coaz). 4
carpinifolia Scop. 1981.

101. Betulaceæ.

520. *Bétula*. Birch. XXI, 10.

1. Ls oval or oval-rhomboidal, acute or acuminate, long-petioled. Trees or (especially on peat-moss) shrubs. Type of *B. alba* 2
- Ls orbicular or orbicular-oval, obtuse or subobtuse, shortly petioled. Low shrubs 3
2. Ls triangular or rhomboidal-triangular, long-acuminate, double-toothed, glabr. when full grown. Fr. surrounded by a wing twice as broad as itself. Branches gen. pendant. *B. alba* auct.—Woods, peat-moss; everywhere. 4
verrucosa Ehrh. 1982.
- Ls oval or oval-rhomboidal, sometimes slightly cordate, acute or short-acuminate, unequally or doubly toothed, when full-grown tufted with hairs underneath, at least in the axils of the nerves. Fr. surrounded by a wing as broad as itself. Twigs stretched forwards, often pubescent. *B. alba* L. ex Fr., *B. glutinosa* Wallr., *B. torfacea* Schleich.—? b. *Murithii* Gaud. Ls shortly petioled, broad, coarsely double-toothed; scales of the fem. catkins large, covered with a dense pubescence. (Mauvoisin in the Bagnethal, probably a good species.)—Peat-moss, especially in the mountain regions, often with *Pinus montana*; distrib. 4 . . . *pubescens* Ehrh. 1983.
3. Ls 15—20 mm long, orbicular-oval, crenate-dentate. Fem. catkins shortly stalked. A shrub of 10—15 dm. *B. nana-pubescent*.—Peat-moss in the Jura; rare. 5
**intermedia* Thom. 1984.
- Ls smaller, suborbicular or even broader than long, obtuse, deeply crenate, the crenelures rounded-obtuse. Fem. catkins almost sessile. A small shrub of 4—6 dm.—Peat-bogs in the Jura, Schwarzenneck, Einsiedeln. 5, 6
nana L. 1985.

521. *Alnus*. Alder. XXI, 9.

1. Fem. catkins of the present year appearing with the ls. Fr. surrounded by a broad, transparent, membranous wing. Ls oval, acute, double-toothed, green on both sides.—b. *minor* Parl. (*brembana* Rota). Dwarf form with much smaller ls, 10—15 mm.—Alp. and subalp., covering

entire slopes, also lower on the Swiss plateau, but wanting in the Jura; b. Tess. (Camoghé, Val Maggia). 5

viridis Dec. 1986.

- Fem. catkins wintering on the twigs of the preceding year, appearing before the ls. Fr. not winged or surrounded by a narrow opaque winged edge . . . 2
- 2. Full-grown ls glabr. underneath, only bearded in the axils of the nerves, glutinous when young, suborbicular or orbicular-obovate, obtuse or emarginate at the top. Lateral fr.-catkins with fairly long stalks.—Damp woods, brooks; distrib. 2, 3 . . . *glutinosa* Gärtn. 1987.
- Ls soft-pubescent underneath or at least covered with rather scattered hairs, not especially bearded in the axils of the ls . . . 3
- 3. Ls oval, acute or short-acuminate, double-toothed, grayish underneath. Lateral fr.-catkins sessile or with very short stalks.—b. *sericea* Christ. Ls more strongly nerved, silky-tomentose and shining on both sides, especially underneath; fr.-catkins with longer stalks. (Val Maggia in Tess., scattered along the edges of the lake of Wallenstadt, and near Aarau).—As the last, rather earlier
incana Dec. 1988.
- Ls orbicular-obovate, obtuse or subacute, unequally crenate-dentate, green on both sides. Lateral fr.-catkins more or less long-stalked. A. *glutinosa-incana*.—Among the parent pls, rather rare: Bünzenermoos. 2, 3
**pubescens* Tausch. 1989.

102. Salicaceæ.

522. *Salix*. Willow. XXII, 8. *)

I. Female plants.

- 1. Catkins terminal, springing from a bud at the tip of the twig. (Dwarf shrubs of the higher mountain regions, very branchy, the trunk creeping) . . . 2
- Catkins lateral on the old wood, sessile or shortly stalked . . . 6
- 2. Ls long-petioled, relatively large (20—40 mm), elliptic-suborbicular, entire, rolled at the edges, glaucous and net-veined underneath, when full-grown glabr., rarely (v. *sericea*) with a slight silken villosity. Capsules tomentose.—High Alp., Salève, Reculet. 7 *reticulata* L. 1990.
- Ls short-petioled, green on both sides, shining . . . 3

*) Revised according to a manuscript which Mr. Buser kindly placed at our disposal.

3. Scales of the catkins blackish. Capsules villous-woolly or (v. *leiocarpa*) glabr. Style long, red. Ls obovate-oblong or obovate-lanceolate, denticulate-glandular*), net-veined, glabr. or feebly hairy, rarely (var. *lanata*) villous-woolly.—Central Alps (wanting in U.). 6
Myrsinites L. 1991.
- Scales of the catkins pale. Capsules gen. glabr. Style short. Ls glabr. 4
4. Ls net-veined, orbicular or broad-oval, dentate-crenate. A shrub of 3—8 cm.—High Alp.; distrib. 7
herbacea L. 1992.
- Ls with almost parallel veins, obovate or oblong-cuneiform, entire or denticulate towards the base. Type of *S. retusa* 5
5. Catkins many-fl'd. Capsules cylindric-conic. Ls with a truncate or slightly emarginate top.—Varied; larger (v. *Kitaibeliana* Scop.) and with rough hairy capsules (v. *trichocarpa*).—Alp., subalp. and Jura; distrib. 6, 7
retusa L. 1993.
- Catkins 3—7-fl'd, the stalks shorter. Capsules oblong-conic, shorter and more obtuse than in the last. Ls smaller and gen. narrower, the top not, or scarcely, emarginate, sometimes slightly pointed—Especially the central and calc. Alp., but growing with the last and sometimes even lower; G. W. Vaud, Uri. 7
serpyllifolia Scop. 1994.
- 6 (1). Scales of the catkins concoloured, greenish or greenish yellow. (Trees or tall shrubs; capsules glabr.) . . . 7
- Scales of the catkins 2-coloured, brownish or blackish at the top 11
7. Catkins preceding the ls, sessile, arched. See *S. incana*. 22.
- Catkins at the same time as the ls, supported by feeble stalks 8
8. Scales of the catkins persistent. Ls lanceolate or oblong-lanceolate, entirely glabr., not viscous, green on both sides or rather paler underneath (a. *concolor* Koch), or glaucous underneath (b. *discolor* Koch). Catkins very slender. Stas 3! *S. amygdalina* Koch.—Water-side; distrib. 4 **triandra L. 1995.**
- Scales of the catkins deciduous before the fr. is ripe 9
9. Ls oval-elliptic, short-acuminate (1 : 2—3),**) glabr., very shiny (as if varnished) above. Stas 4—8.—b. *angustifolia* And. (Friesii Kern.) Ls narrower, 1 : 3—7.—Alpine

*) The variety **Jacquiniiana Willd.**, with entire ls is wanting in Switz.

**) That is to say: 2—3 times as long as they are broad.

- valleys (G. W. O. U.); vallée de Joux in the Jura; also cultivated. 5, 6 **pentandra** L. 1996.
- Ls lanceolate or oblong-lanceolate (1 : 4—7). Stas 2, rarely more **10**
10. Catkins fairly thick, with villous scales. With 2 nectiferous glands. Ls always quite glabrous. Branches very easily torn off from the stem.—Varied rarely with 3 to 5 stas (v. *polyandra* = *S. Pokornyi* Kern.). Water-side; rare (often confused with *S. Russeliana*); Aarau; Meilen, Canton Zürich; Pfäffikon, Canton Schwyz; also cultivated. 4 **fragilis** L. 1997.
- Catkins slender, with pubescent scales at the base, gen. almost glabr. towards the top, or entirely pubescent. With 1 or 2 nectiferous glands. Ls silky underneath when young, glabr. above. Branches brittle. *S. alba-fragilis*! *S. pendula* Ser., *S. viridis* Excl.—Fairly distrib., but probably distributed through cultivation. 4
- * **Russeliana** Koch. 1998.
- Catkins slender, the scales pubescent at the base, gen. glabr. towards the top. With only 1 nectiferous gland. Ls white-silky on both sides, or at least below, rarely (*b. coerulea* Sm.) glabr. Branches flexible.—Varied: c. *vittellina* L. (Golden Osier). Branches of a deep yellow. —By streams and brooks; distrib.; c. cultivated. 4
- alba** L. 1999.
- 11 (6). Capsules sessile or shortly pedicelled, the pedicels at most $1\frac{1}{2}$ times as long as the gland **12**
- Capsules more or less long-pedicelled, the pedicels 2—6 times as long as the gland **19**
12. Capsules compressed, glabr., rarely (in *S. daphnoides*) hairy. Ls elliptic or elliptic-lanceolate, glabr. (rarely hairy). Scales long-villous. Stas glabr., free **13**
- Capsules tomentose **14**
13. Catkins appearing before the ls, entirely sessile, the scales almost entirely blackish, with straight hairs. Branches covered with a bluish powder which disappears when rubbed. Ls shiny above, glaucous underneath. Pedicels of the capsules very short. Style long.—Varied with hairy ls (v. *pilosa*), hairy capsules (v. *trichocarpa*), and smaller, narrower ls (*S. pulchra* Wimm.).—Mount. and subalp.; fairly distrib. 3, before the others
- daphnoides** Vill. 2000. *)

*) ***S. acutifolia* Willd.**, a species from S. Russia, with less numerous catkins, and ls narrower, linear-lanceolate, long-acuminate and green underneath, is cultivated in the Rhine-valley of St. Gall, and by the lakes of Morat and Neuchâtel.

- Catkins appearing with the ls, supported by leafy stalks with rusty brown scales, covered with long, very white, and at last crisp hairs. Branches not pruinose. Ls rather shiny above or dull, green or rather bluish underneath, net-veined. Pedicels of the capsules equal to or almost twice as long as the gland. Style of a medium length.—A larger variety: *b. vegeta* And. (*S. viburnoides* Schl., *S. Hegetschweileri* Heer p. p.); a smaller var.: *c. alpestris* And.—Alp. and subalp., distrib.; Creux du Van in the Jura. 6 . . . *hastata* L. 2001.
- 14. Style very short. Ls lanceolate-oblong, broader towards the top, at last glabr., rarely the full-grown ones silky (v. *sericea*), finely denticulate towards the top. Stas with their filaments united throughout their whole length and appearing as a single sta. with a 4-celled anther, more rarely only as far as the middle, very rarely entirely free. Anthers purple, yellow after shedding the pollen, finally blackish. Catkins sessile, gen. appearing before the ls.—Varied with broad or narrow ls, catkins slender or compact, and (v. *styligera*) the style longer.—Water-side, up to 2000 *m*; distrib. 3 *purpurea* L. 2002.
- Style short or of a medium length. Ls elliptic or obovate, entire, always entirely glabr., when full-grown rather stiff, very glaucous and dull on both sides. Anthers purple, violet after shedding pollen. Catkins small, on leafy stalks.—Valleys of the high Alp., rare; Parpan, Filisur, Albula, Rhone-glacier, Gemmi, Enzeindaz. 7 *cæsia* Vill. 2003.
- Style gen. of a medium length. Ls lanceolate or linear-lanceolate, at first silky-pubescent, shining, when full-grown glabr. and dull above, sinuate-denticulate. Stas with their filaments more or less united (to $\frac{1}{3}$ or $\frac{3}{4}$ their height); anthers sometimes yellowish, sometimes reddish. *S. purpurea-viminalis*! *S. elæagnoides* Tausch. (f. *subviminalis*), *S. Forbyana* Sm. (f. *subpurpurea*).—Not rare, almost commoner than *S. viminalis*, because it is gen. distributed by cuttings; Orbe, Payerne, Thun, Bâle; Aarau, Zürich, &c. 3 . . . **rubra* Huds. 2004.
- Style (and stigs) long. The filaments of the stas free 15
- 15. Catkins appearing before the ls, almost sessile. Branches slender, tapering. Ls long, linear or linear-lanceolate (1 : 8—10), entire or sinuate-wavy, when full-grown silvery-silken underneath with long, applied hairs. Stigs linear, undiv. Stas glabr.—By brooks and rivers, not common and perhaps only cultivated; W. V. B. Z. 3 *viminalis* L. 2005.
- Catkins gen. appearing with the ls, on leafy stalks. Shrubs of the high mount., with short, thick, knotty

- branches. Ls broader in proportion than in the last. (1 : 2—4) **16**
16. Ls, when full-grown, glabr. Stas glabr. Style red. Type of *S. Arbuscula* **17**
- Ls, also when full-grown, tomentose or villous-silken on both sides or at least underneath. Capsules gray- or white-tomentose. Stigs gen. 2-fid **18**
17. Ls gen. elliptic-lanceolate (the greatest breadth at the middle), closely glandular-denticulate, dark green, shiny and with prominent nerves above, glaucous underneath, rarely green on both sides. Catkins shortly stalked. Anthers red, at last violet-brown. A moderate sized shrub. *S. prunifolia* Ser., *S. formosa* Willd., *S. thymelæoides* Schl., *S. foetida* Schl., *S. Arbuscula-foetida* Koch. — Central Alp., fairly distrib., especially on silicious earth; G. W., Gemmi, Sandalp. 7 **Arbuscula L. 2006.**
- Ls gen. obovate-lanceolate, crenate-dentate, the nerves prominent on both sides. Catkins slenderer (3—4 times as long as broad), at last much elongated, as also the branches which bear them. A low shrub of 1—1½ m, with short, divergent branches. *S. Arbuscula Waldsteiniana* Koch p. p.—Limestone Alp. of north-eastern Switz.; Appenzell, Glarus, Chureralp, Pilatus, Unterwalden. 6 **Waldsteiniana Willd. 2007.**
- Comp. also *S. Myrsinites*. 2.
18. Ls denticulate-glandular, elliptic or elliptic-lanceolate, when full-grown green, rather shiny and gen. glabr. above, white-tomentose underneath with mixed hairs, rarely (*v. velutina* Ser.) villous-tomentose (more faintly above) on both sides, or (*v. spuria* Schl. Gaud., *S. Arbuscula-Lapponum* Wimm.) glabr. above and faintly hairy underneath. Scales blackish towards the top or entirely. Stas gen. glabr. Style long. Gland 1. *S. nivea* Ser., *S. arenaria* Ser., *S. Lapponum* Koch p. p., *S. glauca* Heer.—Alp.; G. W. O. Vaud, Uri, Glarus, Appenzell. 6 **helvetica Vill. 2008. *)**
- Ls entire, lanceolate or elliptic-lanceolate, gen. villous-silken on both sides with long, straight and applied hairs, rarely (*v. virescens*) almost glabr. Scales yellowish, reddish or brownish towards the top. Stas hairy below. Style of a medium size. Glands 2. Catkins at last much elongated. *S. sericea* Ser., *S. albida* Schl.—High Alp., on granite and schist; G. T. W. Vaud, Grimsel. 7 **glauca L. 2009.**

*) The true ***S. Lapponum* L.** has ls and capsules less hairy, catkins thicker, almost sessile, style longer and stigs almost always undiv., it belongs to the North of Europe.

- 19 (11). Low shrubs growing on peat-mosses, with decumbent or ascending subterranean stems. Capsules gen. tomentose. Style short. Stas free 20
- Taller trees or shrubs, with erect stems, or low alpine shrubs 21
20. Ls small, lanceolate or (v. *fusca*) elliptic, silvery-silken underneath, the nerves slightly prominent above. Stipules lanceolate. Shrubs of 3—6 dm.—Rarely varied with glabr. capsules (v. *leiocarpa*).—Peat-mosses; fairly distrib. 4 **repens** L. 2010. *)
- Ls larger, obovate-lanceolate, villous-silken underneath, the nerves above sunken, consequently wrinkled. Stipules oval. Differing, in addition, from *S. aurita* in its ls being gen. smaller, almost entire, slightly villous-silken underneath. *S. aurita-repens*! *S. versifolia* Ser. As the last; fairly distrib. 4 ***ambigua** Ehrh. 2011.
21. Style more or less elongated 22
- Style (and stigs) short 24
22. Ls narrow, linear-lanceolate (1 : 8—10), rolled at the edges, tomentose-powdery and dull underneath. Scales rather pale. Stas with hairy filaments, united below (rarely: v. *monandra*, to the top). Catkins almost sessile, slender, arched. Capsules glabr.—Water-side; distrib. 3, 4 **incana** Schrank. 2012.
- Ls broader (1 : 1—4). Scales brownish or blackish at the top. Stas with free filaments 23
23. Ls glabr., rarely (v. *puberula*) feebly hairy on both sides, elliptic, often obovate-oblong, smooth and dark green above, glaucous underneath. Catkins almost sessile. Capsules gray-tomentose, rarely (v. *leiocarpa* = *S. majalis* Wahl.) glabr., the pedicel of a medium length, 2—3 times as long as the gland. Shrubs up to 1 m in height, with tapering branches, of a blackish brown, glabr., very shining. *S. bicolor* Ehrh., *S. Weigeliana* Wimm., *S. Hegetschweileri* (Heer p. p. Koch, *S. phylicifolia-hastata* Wimm., *S. rhætica* Kern.—Subalp.; between Zumdorf and Realp, Rhone-glacier, Ulrichen, Gruyère (not in the Engadine!). 6 **phylicifolia** L. 2013.
- Ls glabr. Catkins on leafy stalks. Capsules glabr. See *S. hastata*. 13.
- Ls, at any rate below, (as also the branches) more or less hairy, rarely (v. *glabra*) glabr., or (v. *cinerascens*) thick haired, grayish, gen. elliptic or oblong-lanceolate, dark green above, gen. glaucous underneath, but the point almost always green, turning black in drying.

*) The variety **argentea** Sm. with broad oval ls, silken on both sides, is doubtful for Switzerland. The var. **rosmarinifolia** Koch is an Eastern plant.

Catkins on leafy stalks, more lax than in the last. Capsules glabr. (v. *leiocarpa* = *S. stylaris* Ser.), or tomentose (v. *eriocarpa* = *S. nigricans* Ser.), long-pedicelled, the pedicels 3—4 times as long as the gland. A very variable species.—Water-side, thickets, up to 2000 *m*; distrib. 4
***nigricans* Sm. 2014.**

- 24 (21). Young twigs and buds pubescent-tomentose. Ls obovate-oblong, gen. broader towards the top, dead green, dull and pubescent above, gray-tomentose underneath. A medium sized shrub with thick branches.—Water-side, thickets; distrib. 3 ***cinerea* L. 2015.**

- Young twigs and buds glabr. or faintly pubescent 25
25. Ls 2—4 *cm* long, pubescent and| dead green above, tomentose and wrinkled underneath, obovate or obovate-oblong, cuneiform at the base. Gen. a low shrub, very branchy, with slender, divaricating branches. Catkins and ls smaller than in *S. cinerea* and *Caprea*; scales rust-coloured at the top.—Peat-mosses, damp forests; distrib. 3 ***aurita* L. 2016.**

- Ls about 5—15 *cm* long, when full-grown glabr. or almost glabr. above 26

26. Catkins almost sessile, preceding the ls. Ls broad-oval or elliptic-orbicular, broadest at the middle, short-acuminate, more or less white- or gray-tomentose underneath. A tree or shrub attaining a height of 9 *m*.—Water-side, thickets; up to the Alp.; distrib. 3

***Caprea* L. 2017.**

- Catkins gen. appearing with the ls, on leafy stalks, looser than in the last. Ls obovate-oblong or oblong-lanceolate, with cuneiform base, broadest towards the top, acuminate, when full-grown pubescent or almost glabr. underneath 27

27. Ls large, 6—15 *cm* long, gen. obovate-oblong or obovate-lanceolate, bluish and pubescent, when full-grown almost glabr. underneath, rather firm, the nerves forming a denser net-work than in the last. Pedicels 4—5 times as long as the gland. A form with ls grayish-tomentose on both sides (v. *cinerascens*) should not be confused with the following species.—Mount., subalp. and Alp.; Jura up to Lägern, fairly distrib. 5 ***grandifolia* Ser. 2018.**

- Ls gen. smaller than in the last, covered when young, as also the capsules, with a woolly, white tomentum, when full-grown thin, easily turning black in drying. Lateral nerves less numerous (9—14) than in the last, more distant, consequently the net-work looser. Catkins longer-stalked, very lax. The filaments of the stas more hairy. *S. pubescens* Schl., *S. grandifolia albicans* Ser., *S. grandifolia lanata* Gaud., *S. Laggeri* (*glauca-grandifolia*)

folia) Wimm.—Eastern Alp.; W. V. (Rhône-glacier, Alp. of Bex, Martinets). 6- . . . *albicans* Bonj. (1809) 2019.

II. Male plants.

1. The 2 filaments of the stas united to various heights (often up to the top), rarely free. Anthers red, yellow after shedding their pollen, and finally blackish. Full-grown ls gen. glabr.: *purpurea*, *cæsia*.
— Stas 2—8, free, or at most united in their lower half, but then the anthers are yellow and the ls hairy 2
2. Stas 4—8: *pentandra*.
— Stas 3: *triandra*.
— Stas 2 3
3. Catkins terminal. Dwarf alpine shrubs 4
— Catkins lateral 6
4. Ls long-petioled, glaucous and net-veined underneath; *reticulata*.
— Ls short-petioled, of almost the same green on both sides 5
5. Anthers red. Scales blackish red: *Myrsinites*.
— Anthers yellow. Scales rather pale: *retusa*, *serpyllifolia*, *herbacea*.
- 6 (3). Scales concoloured, greenish yellow, or greenish. Ls narrow (1 : 4—10) 7
— Scales 2-coloured, brownish or blackish at the top 8
7. Catkins sessile, preceding the ls. Filaments of the stas hairy, united below: *incana*.
— Catkins on leafy stalks, appearing with or after the ls. Filaments of the stas glabr.. free: *alba*, *fragilis*.
8. Ls very narrow, 1 : 8—10, gray- or whitish-tomentose underneath. Catkins sessile, preceding the ls 9
— Ls broader 1 : 1—5 10
9. Filaments of the stas free. Catkins straight: *viminalis*.
— Filaments of the stas united. Catkins arched: *incana*.
10. Full-grown ls glabr. on both sides. Filaments of the stas glabr. 11
— Ls more or less hairy, at any rate underneath 14
11. Catkins entirely sessile, very large and very villous. Branches covered with a bluish bloom: *daphnoides*.
— Catkins on leafy stalks Branches without the bloom 12
12. Scales long-villous, with very white, finally crisp, hairs: *hastata*.
— Scales with straight hairs 13
13. Ls green on both sides, net-veined, shining: *Myrsinites*.
— Ls more or less glaucous underneath: *phylicifolia*, *Arbuscula*, *Waldsteiniana*.
- 14 (10). Ls small, gen. lanceolate, silvery-silken underneath. A dwarf shrub growing on peat-moss: *repens*.

- Ls broad-elliptic or obovate, gray- or white-tomentose underneath. Catkins preceding the ls, sessile or short-stalked: *Caprea*, *cinerea*, *aurita*.
- Ls elliptic or lanceolate, silken-villous or woolly-villous underneath or on both sides. Low alpine shrubs: *glauca*, *helvetica*.
- Ls neither silken nor tomentose. Catkins appearing about the same time as the ls, on short, leafy stalks: *nigricans*, *grandifolia*, *albicans*.

OBS. Hybrids: *S. Arbuscula-grandifolia* (*S. decumbens* Schl., Upper Engadine, Bex); *S. Arbuscula-helvetica* (*S. spuria* Heer, one of the commonest hybrids); *S. Arbuscula-helvetica-grandifolia* (Upper Engadine); *S. Arbuscula-herbacea* (Albula); *S. Arbuscula-reticulata* (*S. reticulata sericea* Schl., Albula, Zermatt); *S. aurita-Caprea* (*S. capreola* Kern., Aarau, Einsiedeln); *S. aurita-cinerea* (*S. multinervis* Döll., *S. lutescens* Kern., Katzenssee); *S. aurita-grandifolia* (*S. limnoga* Kern., Einsiedeln, Rothenthurm); *S. aurita-incana* (*S. oleifolia* Ser., *S. patula* Ser. not Gaud., *S. salvifolia* Koch, Bern, Einsiedeln); *S. aurita-nigricans* (Katzenssee); *S. aurita-purpurea* (*S. mutabilis* Schl., *S. Pontederana dichroa* And., Orbe, Noiraigue, Einsiedeln); *S. cæsia-hastata* (*Silva-plana*); *S. cæsia-nigricans* (Upper Engadine); *S. Caprea-daphnoides* (*S. Cremensis* Kern., Aarau, Einsiedeln); *S. Caprea-grandifolia* (*S. sphacelata* Schl., *S. attenuata*, *dendroides* and *macrophylla* Kern., not rare; *grandifolia-pubescent* near Bex?); *S. Caprea-incana* (*S. longifolia* Schl. nec alior., *S. Kanderiana* Ser., *S. holosericea* Ser., *S. lanceolata* Ser., *S. Seringeana* Gaud., *S. hircina* Kern., *S. oleifolia* auct. helv., not rare); *S. Caprea-purpurea* (*S. Pontederana* Schl. Gaud., *S. Wimmeri* Gr. G., *S. Manternensis* Kern., *S. Traunsteineri* Kern., *S. Rapini* Ayasse, fairly distrib.); *S. Caprea-viminalis* (*S. holosericea* Gaud. not Willd., *S. acuminata* and *Smithiana* Koch p. p., Giebenach, Bâle (Canton), Vevey, Geneva; also cultivated); *S. cinerea-nigricans* (*S. vaudensis* Forb., not Schl. nor Kern., *S. puberula* And., Katzenssee, Mauensee); *S. cinerea-purpurea* (*S. Pontederana sordida* And., Katzenssee); *S. cinerea-viminalis* (*S. Smithiana* Koch p. p., Geneva); *S. daphnoides-incana* (*S. fissa* Reut., *S. Reuteri* Moritzi, *S. Wimmeri* Kern. Geneva, Wynau, Aarau, Chur &c.); *S. glauca-retusa* (*S. elæagnoides* Schl., *S. buxifolia* Schl., *S. Schleicheriana* Kern., Graub., Wall., sometimes almost as common as the parent pls); *S. grandifolia-hastata* (*S. cerasifera pilosa* Schl., Sils, Bex); *S. grandifolia-helvetica* (*S. aurita-Lapponum* Thom., *S. Læstadiana opaca subaurita* And., St. Moritz; in Wall. perhaps *pubescens-helvetica*); *S. grandifolia-incana* (*S. subalpina* Schl., *S. intermedia* Host., *S. oenipontana* Kern., Bex, Meilen, Zug, Einsiedeln, Wallensee); *S. grandifolia-purpurea* (*S. neriifolia* Schl., *S. Pontederana Neilreichii* And., *S. austriaca* Kern., Zermatt, Zürich, Einsiedeln, Wäggithal, Wallensee &c.); *S. grandifolia-repens* (*S. proteifolia* Schl., *S. Lapponum-repens* Wimm.? Lac de Joux); *S. grandifolia-Waldsteiniana* (*S. fruticulosa* Kern., Kurfirsten); *S. hastata-helvetica* (*S. pennina* Schl.; *S. Huteri* Kern., Graub., Wall.); *S. hastata-herbacea* (Upper Engadine, Furka); *S. hastata-Myrsinites* (Gemmi); *S. helvetica-herbacea* (*S. ovata* Ser.! *S. Arbuscula Waldsteiniana* Koch p. p., *S. glauca-herbacea*? And., val Bevers, Grimsel, Aar-glacier); *S. helvetica-incana* (*S. gnaphaloides* Schl., *S. incana-lasiocarpa* Gaud., Bex?); *S. herbacea-serpyllifolia* (Albula); *S. herbacea-Waldsteiniana* (Kurfirsten); *S. incana-repens* (*S. subalpina* Forb. non alior., Switz. according to Forbes); *S. nigricans-repens* (Katzenssee); *S. nigricans-retusa* (*S. Cotteti* Lagg. And., Upper Engadine, Bex, Gruyère.—*S. Chenauxii* Lagg. is a form of *S. nigricans*); *S. phyllicifolia-retusa* (*S. alpigena* Kern., *S. hastata-retusa* Kern., Gruyère); *S. purpurea-repens* (*S. Doniana* Sm. Koch, Katzenssee); *S. reticulata-serpyllifolia* (*S. retusa* Thomasiana Rehb., *S. Thomasii* And., Bagnethal); *S. reticulata-Waldsteiniana* (*S. Gauderi* Hut., Kurfirsten); *S. retusa-Waldsteiniana* (Kurfirsten).—See also *S. Russeliana*, *rubra* and *ambigua*.—The hybrids indicated by Brügger are almost all false.—Under cultivation are: *S. babylonica* L., weeping willow; less commonly: *S. laurina* Sm. (*S. Caprea-phyllicifolia*); *S. Schraderiana* Willd. (*S. phyllicifolia-repens*); *S. mollissima* Ehrh. (*S. triandra-viminalis*).

523. *Populus*. *Poplar*. XXII, 8.

1. Scales of the catkins ciliate. Stas gen. 8 . . . 2
- Scales of the catkins glabr. Stas 12—30 . . . 4
2. Full-grown ls glabr. on both sides, almost orbicular, often broader than long (rarely slightly acute), sinuate-angular-dentate, those of the young shoots very different, large, oval, acuminate, short-hairy.—Woods; everywhere. 3
tremula L. 2020.
- Ls gray- or white-tomentose underneath . . . 3
3. Ls very white-tomentose underneath, those of the young shoots and terminal branches 3- or 5-lobed. Stig. 4-partite (cross-wise).—Damp woods, shores; here and there, probably introduced. 3 . . . *alba* L. 2021.
- Ls gray-tomentose underneath, those of the young shoots and terminal branches not lobed. Stig. 8-partite. Scales of the catkins more deeply incised than in the last. *P. canescens* Sm., *P. alba-tremula*?—As the last but much rarer. 3 . . . *hybrida* Bieb. 2022.
- 4 (1). Young branches corky-angular. Catkins, especially the fem., very lax. Ls broad triangular-oval, gen. broader at the base, than they are long, shortly ciliate at the edges, larger than in *P. nigra*. *P. monilifera* Ait.—An ornamental tree originally from N.America. 4
† canadensis Desf. 2023. *)
- Young branches subcylindric, faintly angled. Catkins dense. Ls glabr. at the edges also . . . 5
5. Branches spreading. Ls triangular-oval.—Water-side; distrib. 3 . . . *nigra* L. 2024.
- Branches connivent-erect (in such a manner that the general outline appears like a long, narrow pyramid).—Cultivated in avenues. 3 . . . *† italica* Mönch. 2025.

103. *Hydrocharideæ*.524. *Vallisneria*. *Vallisneria*. XXII, 18.

1. Rad. ls linear, grass-like, finely denticulate at the top. —Stagnant water; T. (Lugano, Agno). 8 *spiralis* L. 2026.

525. *Hydrócharis*. *Frogbit*. XXII, 17.

1. Ls orbicular-reniform, long peduncled.—Ditches, ponds, rare. V. J. L. Z. 7. . . . *Morsus ranæ*. 2027.

526. *Elódea*. *Elodea*. III, 80.

1. Ls in whorls of 3—4, linear-lanceolate, finely denti-

*) An allied species *P. angulata* Ait., with angular-winged branches is common in the lower Rhone-valley: Jaccard.

culate.—In lakes, rivers and brooks, introduced from N.America; Geneva, Rolle, Morges, Aarau, Zürich. 5—8
canadensis Casp. 2028.

104. Alismaceæ.

527. *Alisma*. *Alisma*. VI, 32.

1. Carpels arranged (as in *Malva*) in subtriangular whorls. Stem 20—100 *cm*. Fls in a branched and pyramidal panicle. Ls oval, often slightly cordate at the base, more rarely (*b. lanceolatum With.*) narrowed-lanceolate at the base.—Ditches, water-side; everywhere. 6
Plantago L. 2029.
 - Carpels arranged (as in *Ranunculus*) in a globular head. Stem 15—20 *cm*. Fls in a simple or double umbel. Ls linear-lanceolate.—As the last, rare; Meyrin near Geneva, lakes of Neuchâtel and Morat; banks of the Aar near Wangen, Canton Bern: Lüscher. 6 *ranunculoides* L. 2030.
- OBS. For a pretended hybrid see N. Beitr. III, 51.

528. *Sagittaria*. Arrowhead. XXI, 20, 33.

1. The first ls linear, the normal ls deeply sagittate. Fls in whorls, forming a raceme.—Water-side, ditches, rare; V. B. J. Z. A. 6 *sagittæfolia* L. 2031.

105. Butomaceæ.

529. *Bútomus*. Butome. IX, 1.

1. Ls rad. linear. Fls rose-coloured, in an umbel. Stem 10—15 *dm*.—Water-side; Neudorf near Bâle, (still abundant in 1878), but beyond the frontiers. 6
*umbellatus L. 2032.

106. Juncagineæ.

530. *Scheuchzeria*. *Scheuchzeria*. VI, 40.

1. Stem leafy. Ls linear. Fls yellowish green, in a 4—10-fld spike which is leafy at the base.—Peat-marshes, especially of the mount. and subalp., rare (wanting in T. W. ? S.). 5, 6 *palustris* L. 2033.

531. *Triglóchin*. *Triglochin*. VI, 40.

1. Rad. ls narrow-linear. Fls small, yellowish green, in a many-fld, leafless raceme.—Marshy fields; distrib. 6
palustre L. 2034.

107. Potamaceæ.

532. Potamogéton. Pond-weed. IV, 24.

1. Ls all opp., clasping, often bent back, oval or lanceolate or linear-lanceolate.—Standing and running water; distrib. 7 **densus L. 2035.**
- Ls altern., only those near the forks almost opp. 2
2. Ls varying from oval to narrow-lanceolate, but, the upper at any rate, never linear **3**
- Ls exactly linear (grass-like) or bristly, $\frac{1}{2}$ —5 mm broad **11**
3. Ls all petioled, or the lower sessile with narrowed base, the upper often floating and then of a different form, and always more or less long-petioled **4**
- Ls all of the same form, submerged, transparent-membranous and sessile with rounded or half-clasping base. (Peduncles almost of equal thickness) **9**
4. Ls smooth at the edges, the upper always floating, leathery; all long-petioled. Peduncles equal in thickness to, or hardly thicker than, the stem. Type of *P. natans* **5**
- Ls smooth at the edges, often reddish, the upper frequently floating, petioled, the petioles always shorter than the ls; submerged ls always present. Peduncles as in the last section **6**
- Ls more or less rough at the edges, the upper sometimes floating, more or less long-petioled; submerged ls always present. Peduncles thickened towards the top, distinctly thicker than the stem Type of *P. Proteus Cham. Schl.* **7**
5. Limb of the submerged ls destroyed by putrefaction before the time of flowering, consequently their petioles leafless; floating ls (often brownish) oval or oblong, the base gen. slightly cordate and, when the limb is stretched out in the same plane with the petiole, raised in a fold on each side. Petioles slightly hollowed or flat above.—Stagnant or slowly flowing water; distrib. 6
natans L. 2036.
- Limb of the submerged ls gen. still remaining at the time of flowering; floating ls oval or oblong-lanceolate, the base rounded or narrowed and with no fold when the limb is stretched in the same plane with the petiole. Petioles slightly convex above.—Running water; not common. 6 **fluitans Roth. 2037.**
6. Ls all petioled, of an equal consistency; submerged ls oblong-lanceolate or elliptic; the upper often floating, oval or almost orbicular, the base often rounded or

almost cordate. Carpels small, obtusely keeled. Stem branchy. *P. plantagineus* Ducros, *P. Hornemanni* Koch. —Stagnant water, rare; W. V. B. Z. Glarus. 6

coloratus Vahl. 2038.

- Submerged ls sessile (the base often narrowed like a petiole), long-lanceolate (up to 10 cm long); floating ls, when present, leathery, oblong, obtuse, cuneiform narrowed to a petiole. Carpels large, with a sharp keel. Stem gen. simple. *P. alpinus* Balb., *P. obtusus* Duer.—Stagnant or slowly flowing water; not common (wanting in T. S.). 6

rufescens Schrad. 2039.

- 7 (4). Ls obtuse or acute, rather small, very slightly rough, the submerged ls sessile, linear-lanceolate; floating ls, when present (v. *heterophyllus*), leathery, oval or oblong, with long petioles. Stem very branchy, flexible.—As the last; not common (wanting in G. T.). 6

gramineus L. 2040.

- Ls distinctly mucronate, rough-denticulate at the edges, all of the same consistency, membranous-transparent, all shortly petioled, or the upper sometimes with a longer petiole and almost floating. Stem branchy 8

8. Ls (shining as if varnished) large (10—15 cm long), all of the same form and shortly petioled, oblong-lanceolate (in b. *longifolius* Gay long-lanceolate, acuminate, 20—22 cm long and 18—28 mm broad), fairly often terminated by a long horn-like point (v. *cornutus* Presl.). —As the last; distrib.; b. Schwarzsee, Canton Freib. 6

lucens L. 2041.

- Ls smaller, 7—8 cm long and 10—12 mm broad, oblong-lanceolate, the upper elliptic with a petiole half as long as the limb, often almost floating. *P. gramineus* var. Koch, *P. lucens* var. Nolte, Aschers.—Reuss near Mäschwanden! Yverdon and probably other places. *)

Zizii M. K. 2041. b

- 9 (3). Carpels terminated by a long recurved beak. Ls wavy-crisp, finely denticulate, linear-oblong.—As the last; distrib. 6

crispus L. 2042.

- Carpels terminating in a short point 10

10. Ls (dirty green) round-oval, oval or lanceolate, cordate-clasping at the base, rough-denticulate at the edges. Spikes short.—As the last; distrib. 6

perfoliatus L. 2043.

- Ls (bright green) lanceolate, elongated, 90—180 mm long, rounded at the base, half-clasping, concave at the tip, smooth at the edges. Spikes gen. elongated.—As the last; lac alpin of Brettaye, lac d'Étalières. 7

prælongus Wulf. 2044.

*) Also indicated in the French Jura and in Canton Schaffh. Nervation of the ls more resembling that of *P. lucens* than *P. gramineus*!

- Ls oblong-elliptic, 45—75 *mm* long, rounded at the base, not clasping, almost smooth at the edges. *P. lucens-perfoliatus*?—As before; Geneva, Aarau. 6
- **decipiens* Nolte. 2045.
- 11 (2). Ls clasping the stem with their bases like sheaths 12
- Ls without sheaths 13
- 12. Carpels 3—4 *mm*; almost half-circular, keeled. Like 2052, but ls with distinct lateral nerves.—As the last; distrib. 7
- pectinatus* L. 2046.
- Carpels smaller, obovate, almost globular, not keeled.—Alpine lakes, rarely lower; Chur, Engadine, Fully, Schwarzsee, Thun, Interlaken, lac des Rousses. 7
- marinus* All. 2047.
- 13. Stems and branches compressed-winged. Ls (3—5 *mm* broad) finely multinerved, with 3—5 more prominent nerves 14
- Stem and branches cylindric, or compressed with rounded angles. Ls ($1\frac{1}{2}$ —3 *mm* broad) with 1—5 nerves . . . 15
- 14. Spikes cylindric, composed of about 10—25 fls, long-peduncled; peduncle 2—3 times as long as the spike. *P. zosterifolius* Schumch.—Stagnant or slow-flowing water, rare; lac des Rousses, lac d'Etalières. 6 *compressus* L. 2048.
- Spikes ovoid, composed of about 4—8 fls, shortly peduncled; peduncle about as long as the spike. Pl. denser. As the last; Wall.? french Jura. 6 *acutifolius* Link. 2049.
- 15. Peduncles as long or hardly longer than the spike; spike dense, composed of about 6—8 fls. Ls obtuse or short mucronate.—As the last; rare or overlooked; lac d'Etalières. 6 *obtusifolius* M. K. 2050.
- Peduncles much longer than the spike; spike lax or rather so when mature 16
- 16. Stem almost quadrangular-compressed. Stipules 2-fid. Ls 2—3 *mm* broad. Peduncles slightly thickened towards the top. *P. Oederi* W. Mey., *P. Friesii* Rupr.? *P. pusillus* major Koch.—As the last; on account of confusion with the following, the localities have still to be verified; lake of Zürich (Rechb.). *mucronatus* Schrad. 2051.
- Stem almost cylindric. Stipules entire. Ls $1\frac{1}{2}$ —2 *mm* broad. Peduncles filiform. *P. Berchtoldi* Fieb.—As the last; probably distrib. 6 *pusillus* L. 2052.

533. *Zannichellia*. *Zannichellia*. XXI, 23.

- 1. Stem and ls filiform.—*b. tenuis* Reut. Ls finer, carpels only half the size. (Between Genthod and Versoix).—Stagnant or slow-flowing water; distrib. but not common. 6 *palustris* auct. 2053.

108. Naiadaceæ.

534. *Naias*. *Naiad*. XXI, 21. XXII, 18.

1. Fls diœcious. L.-sheaths with entire edges. Ls broad-linear (broader than the stem).—b. *intermedia* Wolfg. Pl. smaller, ls narrower, sheaths with isolated teeth.—Stagnant water, rare; T. J. U. Z.; b. Robenhausen, Eschenz (Thurgau). 7 . . . *major* All. 2054.
- Fls monœcious. L.-sheaths ciliate-denticulate. Ls narrow-linear ($1\frac{1}{2}$ mm). *Caulinia fragilis* Willd.—As the last; Nyon, Roggwyl, Michelfelden, Wangen, Mammern (Lake of Constance). 7 . . . *minor* All. 2055.

109. Lemnaceæ.

535. *Lemna*. *Duckweed*. XXI, 17. XXII, 15.

1. Fronds ("leaves") orbicular-obovate, each with a tuft of 6—7 roots, reddish underneath (5—7 mm).—Standing water, not common (wanting in G. T. U. W.?). 5
polyrrhiza L. 2056.
- Fronds each with a single root . . . 2
2. Fronds (7—10 mm) thin, oblong-lanceolate, narrowed like a petiole to one end, submerged except while flowering.—As the last (wanting in G. T. U. W.?). 4
trisulca L. 2057.
- Fronds (2—3 mm) slightly thickened, orbicular-obovate, not narrowed to a petiole, always floating . . . 3
3. Fronds fairly flat on both sides.—As the last; everywhere. 4 . . . *minor* L. 2058.
- Fronds flat above, very convex underneath.—As the last, but rare; W. V. Z. 4 . . . *gibba* L. 2059.

110. Typhaceæ.

536. *Typha*. *Reedmace*. XXI, 30.

1. Caul. ls reduced, almost scale-like (in an autumnal form = T. Martini Jord. often as long or longer than the inflorescence). Fr. without a longitudinal furrow. Stem 4—10 dm. T. minima Hopp.—Water-side; not common (wanting in S.). 5 . . . *Laxmanni* Lepech. 2060.
- Caul. ls longer than the stem. Fr. with a longitudinal furrow . . . 2
2. The 2 spikes of the inflorescence rather distant from one another. Stig. linear. Ls 4—8 mm broad. Fem. spike brown-red. T. media Schl. (larger form).—Water-side, ditches; W. B. J. L. Z. S. 6 . . . *angustifolia* L. 2061.

- The 2 spikes of the inflorescence gen. touching. Stig. spatulate-lanceolate 3
- 3. Stig. exceeding the hairs of the perianth. Ls 12—18 mm broad. Fem. spikes (at the last) blackish brown. Stem 10—20 dm.—As the last; distrib. 6 *latifolia* L. 2062.
- Stig. shorter than or hardly as long as the hairs of the perianth. Stem lower; ls narrower (5—10 mm broad); fem. spike gray; male spike shorter.—As the last; Rolle? banks of the Aar near Thun, Bern, Lyss, Aarau; edges of the Singine near Neueneck; of the Saane near Freib.; Bünzenermoos near Muri; Baar on the Lorze. 6 *Shuttleworthii* K. S. 2063.

537. *Sparganium*. Bur-reed. XXI, 30, 22.

- 1. Male heads 1—2. Stig. oblong-linear. Ls flat, floating in the water, as also the stem. *S. natans* auct.—Marshes of peat-mosses; ditches; distrib. but not common. 7 *minimum* Fr. 2064.
- Male heads 4—10. Stig. linear. Ls 3-cornered at the base, gen., like the stem, erect 2
- 2. Stem simple above. (Heads in a raceme, and above that in a spike.) Ls with flat side-faces.—b. *fluitans* A. Br. Stem and ls elongated, floating in the water. *)—Ditches, ponds; distrib., but less common than the following. 6 *simplex* Huds. 2065.
- Stem branchy above. Ls with concave side-faces.—As the last; distrib. 6 *ramosum* Huds. 2066.

111. Aroideæ.

538. *Arum*. *Arum*. XXI, 27.

- 1. Spadix blackish violet. Ls uniformly green or spotted with black.—Hedges, thickets; distrib. 5 *maculatum* L. 2067.
- Spadix yellow. Ls with whitish nerves.—T. (Gandria). 4 *italicum* Mill. 2068.

539. *Calla*. *Calla*. XXI, 27. VI, 30.

- 1. Ls cordate. Spathe white inside.—Marshy wooded places; Lucern (Chüsirainwald near Sempach, and between Meggen and Adligenschwyl). 6 *palustris* L. 2069.

*) We do not know if the pl. of Vuadens, Canton Freib., belongs to this or to the closely allied species: *Sp. affine* Schnitzl.; the latter differs in very long, limp and almost flat ls, it is found in the Black Forest and in the Vosges.—*Sp. natans* Fr., a northern species, differs from it.

540. *Acorus*. Sweet-flag. VI, 30.

1. *Is ensiform*. Spadices apparently lateral.—Marshy places; water-side; scattered (wanting in G.? S.). 6

Calamus L. 2070.

112. Orchidaceæ.

541. *Orchis*. *Orchis*. XX, 6.

1. Lip undivided 2
- Lip 3-toothed, 3-fid or 3-partite 3
2. Tubers palmate. Fls blackish red. Comp. the genus *Nigritella*.
- Tubers undiv. Fls white. Comp. the genus *Platanthera*.
3. Lip 3—4 times as long as the other divisions of the perianth; the middle lobe 45—60 mm long! Comp. the genus *Himanthoglossum*.
- Lip shorter, or at all events not 3—4 times as long as the divisions of the perianth 4
4. The 5 divisions of the perianth all converging in the form of an helmet (converging feebly in 2076) 5
- The 2 lateral, of the outer divisions of the perianth spreading or reflexed 13
5. Tubers div., palmate. Fls greenish or whitish. Comp. the genus *Coeloglossum*.
- Tubers undiv. Fls of a different colour 6
6. Lip 3-partite, the middle lobe 2-fid or 2-lobed, gen. with a small tooth in the incision. Stem with reduced, sheath-like ls above 7
- Lip 3-fid or 3-lobed, the middle lobe undiv., or at most emarginate. Stem almost entirely leafy 11
7. Bracts, at most, $\frac{1}{4}$ the length of the ovary. Type of *O. militaris* 8
- Bracts, at least, half as long as the ovary 10
8. Helmet shortly ovoid, blackish red outside (darker than the lip). Bracts $\frac{1}{5}$ — $\frac{1}{7}$ the length of the ovary. Middle lobe of the lip with a base 4—5 times as broad as the lateral lobes. *O. fusca* Jacq.—Thickety hills, wood-sides; not common (wanting in G. T. W. U.). 5
- purpurea* Huds. 2071.
- Helmet ovoid-lanceolate, rosy gray (lighter than the lip). Bracts $\frac{1}{4}$ — $\frac{1}{5}$ the length of the ovary. Middle lobe of the lip almost as narrow as the lateral lobes 9
9. Lobules of the middle lobe as narrow as the lateral lobes of the lip, elongated and bent upwards. Fls of the spike opening from the top downwards, while in

the following the order is reversed. *O. Simia* auct.—
As the last; basin of the lake of Geneva. 5

tephrosanthos Vill. 2072.

- Lobules of the middle lobe 2—3 times as broad as the lateral lobes of the lip, short, divergent.—As the last; distrib. 5

militaris L. 2073.

- 10 (7). Fls small (8—10 mm long); lip white, spotted with red. Helmet blackish red (spike as if burnt by fire). Spur $\frac{1}{4}$ — $\frac{1}{3}$ the length of the ovary.—Pasturages, plains in the neighbourhood of woods; distrib. 5

ustulata L. 2074.

- Fls larger; lip pale lilac, spotted with red. Spur at least half as long as the ovary. *O. variegata* All.—Tess. 5

tridentata Scop. 2075.

- 11 (6). Spike dense, hemispheric or short pyramidal. Divisions of the perianth terminating in a broad subspathulate point. Ls glaucous.—Alp., subalp. and Jura. 6

globosa L. 2076.

- Spike lax or fairly lax. Divisions of the perianth obtuse, acute or acuminate

12

- 12. Divisions of the perianth obtuse; helmet very obtuse, streaked with green; lip with 3 short lobes. Spike lax and few- (up to about 10) fld.—Meadows; everywhere. 5

Morio L. 2077.

- Divisions of the perianth short acuminate; helmet pointed, of a dirty reddish brown; lip 3-fld. Spike cylindric, fairly dense and many-fld.—Meadows; not common (wanting in U. Z.). 5

coriophora L. 2078.

- 13 (4). Spur filiform, slender (never 1 mm in thickness) 14

- Spur cylindric, thicker

15

- 14. Tubers undiv. Pedicels of the 2 pollen-masses united at the base. Comp. the genus *Anacamptis*.

- Tubers palmatifid. Pollen-masses separate. Comp. the genus *Gymnadenia*.

- 15. Tubers undivided

16

- Tubers palmatifid (in 2083 only shortly 2—3-fld at the end)

19

- 16. Bracts 1- (or 3-) nerved. Spur as long as the ovary. Stem leafless above. Ls oblong-lanceolate or oblong-obovate 17

- Bracts 3—5-nerved (or the lower many-nerved). Spur shorter than the ovary. Stem more reg. leaved. Ls oblong-linear, channeled. (Spike lax.) Type of *O. laxiflora* 18

- 17. Spike short, fairly dense. Fls pale-yellow, with a scent of elder. Lip slightly 3-lobed.—Woods of the mount.; not common (wanting in J.). 4, 5

pallens L. 2079.

- Spike elongated, lax. Fls purplish, gen. scentless. Lip deeply 3-lobed.—Pasturages, wood-sides; distrib. 5

mascula L. 2080.

542. Anacamptis. Anacamptis. XX, 6.

1. Tubers undiv. Spike short conical. Lip 3-fid to the middle, the lobes almost equal, with 2 tooth-shaped supports at the base. Spur slender, long.—Pasturages, especially of the mount. and subalp. (wanting in U.). 6
pyramidalis Rich. 2088.

543. Himantoglossum. Himantoglossum. XX, 6.

1. Tubers undiv. Lip 3-partite, the middle lobe very long (45—60 mm!) riband-shaped, div. at the end; the lateral lobes much shorter. Spur very short.—Sunny hills, not common; V. J. Z. S. (Western and northern Switz.). 6
hircinum Sprgl. 2089.

544. Gymnadénia. Gymnadenia. XX, 6.

1. Spur $1\frac{1}{2}$ —2 times as long as the ovary.—b. *densiflora* A. Dietr. (anisoloba Peterm.). Pl. more robust; ls broader; fls larger, in a denser spike; later.—c. *intermedia* Peterm. (conopea-odoratissima?). Pl. less robust; spur scarcely as long as the ovary.—Wood-clearings; distrib.; b. Les Devens (Bex); c. Neuchâtel? 6 . *conopéa* R. Br. 2090.
- Spur shorter than, or hardly as long as, the ovary. Pl. slighter; ls narrower.—As the last, but chiefly in the mount. and subalp. 6 . *odoratissima* Rich. 2091.

OBS. Hybrid: *G. odoratissima*- (*Coeloglossum*) *albida* (*G. Strampfilii* Aschers.). Comp. also *Nigritella*.

545. Coeloglossum. Coeloglossum. XX, 6.

1. Lip deeply 3-fid, the middle lobe rather broader. Spur up to $\frac{1}{3}$ the length of the ovary. Fls small, 2—3 mm long, whitish, in a cylindrical spike. *Gymnadenia albida* Rich.—Alp., subalp. and Jura. 6 . *albidum* Hartm. 2092.
- Lip broad-linear, 3-toothed at the end, the middle tooth very short. Spur very short, saccate. Fls larger, yellowish green, often tinted with brown, in an oblong spike. *Platanthera viridis* Lindl.—Alp., subalp. and Jura, also found lower. 6 . *viride* Hartm. 2093.

546. Platanthéra. Platanthera. XX, 6.

1. Anther-cells close together, parallel. Spur gen. slender. Fls white, perfumed.—Woods; distrib. 5 *bifolia* Rchb. 2094.
- Anther-cells close together above, spreading apart below. Spur gen. slightly swollen in the shape of a club. Fls greenish, rather larger, almost scentless. *P. chlorantha* Cust.—As the last but rather later *montana* Rchb. f. 2095.

547. Nigritella. Nigritella. XX, 6.

1. Tubers palmate. Fls blackish red (rarely paler, very rarely yellow e. g. on the Gotthard-Strasse above Gö-

schenen), with a scent of vanilla. Spur hardly $\frac{1}{3}$ as long as the ovary. *O. nigra* Sw.—Alp., subalp. and Jura. 6, 7 *angustifolia* Rich. 2096.

OBS. Forms hybrids with *Gymnadenia conopsea* (*N. fragrans* Saut., *N. Moritziana* Grml.), and with *G. odoratissima* (*N. suaveolens* Koch, *N. Heufleri* Kern.).

548. *Ophrys*. *Ophrys*. XX, 10.

1. Lip almost flat, 3-fid; the middle lobe longer, deeply 2-lobed. The 2 inner divisions of the perianth linear-filiform, only about $\frac{2}{3}$ as long as the outer. *O. myodes* Jacq.—Sunny pasturages, hills; distrib. 5, earlier than the following species. *muscifera* Huds. 2097.
- Lip convex. The 2 inner divisions of the perianth oblong or triangular, much shorter than the outer or, indeed, hardly visible 2
2. Outer divisions of the perianth greenish, the inner oblong, glabr. Lip undiv., or faintly incised at the top, without an appendage.—As the last (wanting in U. L.). 5 *aranifera* Huds. 2098.
- Outer divisions of the perianth rose-coloured, the inner triangular, short-pubescent. Lip with an appendage at the top 3
3. Lip orbicular-obovate, undiv.; appendage curved upwards. Column with a short straight beak. *O. arachnites* Host.—As the last (wanting in G.). 5 *fuciflora* Rchb. 2099.
- Lip oblong-obovate, 3—5-lobed; appendage curved downwards. Column with a longer, flexible beak. *O. chlorantha* Heg. (with greenish fls).—b. *Trollii* Heg. (*O. fuciflora-muscifera* Reg.) Lip elongated, acute, not recurved; lateral lobes more or less reduced. (Winterthur, Bex.)—As the last, but gen. rarer and rather later (wanting in G. T.) *apifera* Huds. 2100.

OBS. Hybrids: *O. aranifera-muscifera* (*O. apiculata* J. C. Schmidt); *O. fuciflora-muscifera*? (*O. devenensis* Rchb. f.)

549. *Chamæorchis*. *Chamæorchis*. XX, 11.

1. Tubers undiv. Ls several, narrow linear, as long as, or longer than, the stem. Fls yellowish green.—Alp. 7 *alpina* Rich. 2101.

550. *Aceras*. *Aceras*. XX, 11.

1. Tubers undiv. Fls yellowish green. Lip hanging, 4-partite, with linear lobes.—Pasturages, sunny hills (wanting in G. T. O. U. A.). 4—5 . . . *anthrophora* R. Br. 2102.

551. *Herminium*. *Musk-orchis*. XX, 11.

1. Tuber 1, with a second at the end of a stolon. Fls small, yellowish green, in a slender spike.—Pasturages especially of the mount. and subalp. 5 *Monorchis* R. Br. 2103.

552. **Serápias. Serapias.** XX, 8.

1. Tubers undiv. Bracts very large, coloured. Fls large.—
Tessin. 5. **longipetala Pollin.** 2104.

553. **Epipógon. Epipogon.** XX, 4.

1. Rhizome in the form of coral (the ramifications thickened into tubercular joints). Fls 3–5, large, yellowish white. The whole pl. with a yellowish hue.—Damp woods, on rotten wood, not common (wanting in T. L. S.). 7
aphyllum Sw. 2105.

554. **Limodórum. Limodorum.** XX, 4.

1. Rhizome thick, noded. Fls large. The whole pl. with a violet hue.—Woods, thickets; rare (wanting in U. L. S. A.). 5 **abortivum Sw.** 2106.

555. **Cephalanthéra. Helleborine.** XX, 16.

1. Fls rose-coloured. Ovary hairy.—Woods and clearings; distrib. 6 **rubra Rich.** 2107.
— Fls white or yellowish white. Ovary glabr. 2
2. Bracts, except the lowest, very short, much shorter than the ovary. Ls linear-lanceolate, almost distichous. C. ensifolia Rich.—As the last. 5 **Xiphophyllum Rchb. f.** 2108.
— Bracts longer than the ovary, or only the lower longer and the others as long or not quite as long. Ls oval or oval-lanceolate. C. pallens Rich.—As the last. 5
grandiflora Babgt. 2109.

556. **Epipactis. Epipactis.** XX, 16.

1. The terminal lobe of the lip orbicular-obtuse. Rt-stock stoloniferous.—Damp meadows; distrib. 7
palustris Crantz. 2110.
— Terminal lobe of the lip acuminate. Type of *E. Helleborine* Rchb. f. 2.
2. Ls shorter than the internodes, small, glabr., on the nerves also. Pl. slender.—Woods of the mount., rare; G. V. J. Z. 6 **microphylla Sw.** 2111.
— Ls longer than the internodes, rough-pubescent on the nerves 3
3. Protuberances at the base of the lip smooth. Fls greenish or (in sunny spots) tinted with red.—Woods; distrib. 6, 7
latifolia All. 2112.
— Protuberances at the base of the lip wrinkled-crenate. Fls of a dark red-brown, smaller than in the last, with a scent of vanilla. Pl. slenderer. *E. rubiginosa* Crantz.—Woods, thickety hills especially on calc. soil. 6, rather earlier **atrorubens Schult.** 2113.

557. Listéra. Twayblade. XX, 13.

1. Ls oval. Lip linear, deeply 2-fid. Stem 30—45 *cm.*.—Damp meadows and wood-sides; distrib. 5
ovata R. Br. 2114.
- Ls almost triangular, heart-shaped at the base. Lip with 2 small lateral teeth at the base, 2-fid to the middle. Stem 5—12 *cm.*.—Mossy woods, especially of the mount. and Alp., not common (wanting in T. Z. S.): 5
cordata R. Br. 2115.

558. Neóttia. Neottia. XX, 5.

1. Rt. consisting of thick fibres closely knotted together (appearing sometimes like a bird's nest). The whole pl. of a very light brown.—Shady woods; on decayed ls; distrib. 5 *nidus avis* Rich. 2116.

559. Goodyéra. Goodyéra. XX, 15.

1. Rhizome branchy, stoloniferous. Ls oval or elliptic, net-veined, the lower petioled. Fls white.—Mossy pine forests; distrib. but not common. 7 *repens* R. Br. 2117.

560. Spiranthès. Spiranth. XX, 9.

1. Stem with 2—3 narrow-lanceolate ls below. Tubers 3—5, cylindric-fusiform. —Swampy meadows; not common (wanting in G.). 7 *æstivalis* Rich. 2118.
- Stem with distant, bract-like ls; normal ls in a lateral rosette, oblong-elliptic. Tubers 2—3, oblong-cylindric (turnip-shaped).—Damp meadows and pasturages; distrib. 8 *autumnalis* Rich. 2119.

561. Corallorrhiza. Coral-root. XX, 5.

1. Rt-stock branching like coral. The whole pl. of a greenish white. Lip spotted with red.—Mossy pine-forests, especially of the mount. and subalp.; not common. Z. (wanting in T. S.). 5 *innata* R. Br. 2120.

562. Sturmia. Sturmia. XX, 12.

1. Stem bearing 2 ls at the base. Lip obovate. Peat-mosses; not common (wanting in G. T.). 6 *Loeselii* Rchb. 2121.

563. Maláxis. Malaxis. XX, 12.

1. Stem with 3—4 ls below. Inner divisions of the perianth oval-oblong.—Swampy meadows; Studenmoos near Einsiedeln (still to be found there?) 7 *paludosa* Sw. 2122.
- Stem with 1 leaf (rarely 2). Inner divisions of the perianth linear. *Microstylis monophylla* Lindl.—Grassy, shaded, damp places of the mount. and subalp., not common; G. O. U. A. 7 *monophylla* Sw. 2123.

1. Stem bearing 1—2 fls; fls very large; lip yellow, streaked with red-brown. Divisions of the perianth purple brown. — Woods, thickety hills; distrib. but not common. 6

Calceólus L. 2124.

565. **Crocus. Crocus.** III, 8.

1. Stig. much shorter than the limb of the perianth.—Pasturages of the Alp., subalp. and Jura, to the foot of the mountains. 3, 4, later in the Alp. after the snow-melting. **vernus Wulf.** 2125. *)
— Stig. about as long as the limb of the perianth.—Cultivated in Wall. (formerly at any rate) and rarely spontaneous. 9 † **sativus L.** 2126.

566. **Gladiolus. Gladiolus. III, 7.**

1. Anthers longer than their filaments. Seed not winged.
—Fields; Lugano, Geneva. 6 **segetum** Gawl. 2127.
- Anthers shorter than their filaments. Seed winged 2
2. Bulb enveloped in a tissue of fibres knotted towards
the top in a net-work of oval meshes. Spike composed
of 2—5 fls. Capsule with 6 furrows, rounded at the top.
Damp meadows, rare; G. W. V. Z. S. A. 5
palustris Caud. 2128.
- Bulb surrounded by a tissue forming a few narrow,
linear meshes at the top. Spike composed of 5—10 fls.
Capsule with 3 deep furrows, depressed at the top; the
angles raised above in an obtuse keel. Stem taller, ls
narrower than in the last.—As the last; Vaud, in several
places, probably subspontaneous. 5 **communis** L. 2129.
- As the last, but the spike composed of 7—8 crowded
fls., rather bluish after drying. Angles of the capsule
always rounded (Koch).—Tess. (Melano, Giorgio)
imbricatus L. 2229.b

567. Iris. Iris. III, 8.

- | | |
|--|---|
| 1. Outer segments of the perianth bearded inside . | 2 |
| — Outer segments of the perianth not bearded . | 7 |
| 2. Stem bearing 1—2 fls | 3 |
| — Stem bearing several fls | 4 |
| 3. Tube of the perianth enclosed in the spathe. Stem longer than the ls, about 30 cm long. Fl. whitish yellow. I. lut- | |

*) With us there is only the variety **albiflorus Kit.**; the typical form, with the stig. exceeding the tips of the anthers, is found in upper Italy.

- escens Gaud. Koch not Lam.—Rocks near Sion (Tourbillon). 4 **virescens** Red. 2130.
- Tube of the perianth much exceeding the spathe. Stem shorter than the ls, only 5–10 *cm* long. Fls blue, violet, pale yellow or white.—Southern Tyrol; with us sometimes planted on walls, or in borders, also spontaneous. 4 † **pumila** L. 2131.
4. Perianth uniformly yellow, or the outer segments veined with violet. Ls almost as long as the stem.—Altdorf, Hohentwiel; cultivated in gardens. 5 † **variegata** L. 2132.
- Segments of the perianth, at least the outer ones, violet. Stem distinctly longer than the ls 5
5. Floral spathes already scarious from the base by the time of flowering.—Southern Tyrol; indicated at St. Maurice in Wall. 5 * **pallida** Lam. 2133.
- Floral spathes herbaceous from the base to the middle, scarious above 6
6. Filaments of the stas as long as their anthers. Lobes of the upper lip of the stigs diverging.—Rocks and walls in warm parts; also in gardens and spontaneous. 5 **germanica** L. 2134.
- Filaments of the stas 1½ times as long as their anthers. Lobes of the upper lip of the stigs touching each other by their inner edges.—Altdorf, spontaneous on walls, Mägdeberg in the Höhgau of the Grand Duchy of Baden. 5, later than the last. † **sambucina** L. 2135.*)
- 7 (1). Fls yellow. Inner segments of the perianth smaller than the stigs.—Marsh ditches; distrib. 6
- Pseudácorus** L. 2136.
- Fls violet. Inner segments of the perianth larger than the stigs 8
8. Stem longer than the ls, cylindric, bearing 2–5 fls, 45–90 *cm* high.—Damp meadows, rather rare (wanting in T. J. S.). 6 **sibirica** L. 2137.
- Stem much shorter than the ls, compressed-2-edged, bearing 1–2 fls, 15–25 *cm* high.—Tess. (S. Giorgio, Generoso). 5 **graminea** L. 2138.

114. Amaryllideæ.

568. *Leucojum*. Snowflake. VI, 10.

1. Stem 1-fl'd (rarely 2-fl'd), 10–15 *cm*.—Damp woods and plains; distrib. 2, 3 **vernum** L. 2139.
- Stem 3–6-fl'd, 30–40 *cm*.—Damp meadows; J. Yverdon (formerly), Nidau. 4, 5 **æstivum** L. 2140.

*) *I. squalens* L. indicated near Tarasp. See N. Beitr. III, 24.

1. Stem 1-fl'd.—Meadows, orchards; not common (wanting in G. U.). 2, 3 *nivalis* L. 2141.

1. Crown campanulate, as long as the divisions of the perianth, both yellow.—Meadows, especially of the mount. and subalp.; in batches and fairly distrib. 3, 4
Pseudonarcissus L. 2142.

— Crown campanulate, half as long as the divisions of the perianth, crown yellow, perianth pale yellow. *N. pseudonarcissus-poeticus* (or *-radiiflorus*).—As the last; Wall.; (val d'Illiez), Lucern.*) 3. **incomparabilis Curt. 2142.b**

— Crown cup-shaped, much shorter than the divisions of the perianth, the latter white 2

2. Stem bearing 1 (2—3) fls. Crown entirely yellow. Divisions of the perianth broad, dirty white.—Meadows; Sion, Bex, Geneva. 4 **biflorus Curt. 2143.**

— Stem bearing 1 fl. (rarely 2). Crown yellow, with a scarlet edge 3

3. Divisions of the perianth oval, imbricate at the margins. Ovary compressed laterally, 2-edged at the time of flowering.—Ornamental pl., sometimes subspontaneous in orchards. 4 † **poëticus L. 2144.**

— Divisions of the perianth oblong, separated or hardly touching. Ovary cylindric. Stem slenderer; ls narrower than in the last.—Plains of the Alp., subalp. and Jura (wanting in T. A.). 5 **radiiflorus Salisb. 2145.**

571. **Aspáragus. Asparagus.** VI, 18. XXII, 28.

1. Peduncles jointed close to the fls. Berries the size of a cherry. Stem 3—5 *dm.*—Tess. (Mt. Generoso, St. Giorgio, Bré). 5 **tenuifolius** L. 2146.
— Peduncles jointed at the middle or rather higher. Berries the size of a pea. Stem 5—10 *dm.*—Sandy, stony places, near water; here and there (wanting in U. L. S. A.); otherwise cultivated. 5, 6 **officinalis** L. 2147.

1. Ls oval, clasping. Peduncles solitary in the axils of the
ls but bent round the stem and under the ls, with a

*) The Lucern pl., probably only subsontaneous, is perhaps *N. poeticus-Pseudonarcissus*, which is sometimes cultivated in gardens.

knee in the middle.—Woods of the mount.; here and there (wanting in Z. S.). 5 . **amplexifolius** Dec. 2148.

573. Páris. Paris. VIII, 19.

1. Stem simple, 1-fl'd, bearing 4 (3—6) whorled, broad-oval ls above.—Woods, thickets; distrib. 5 **quadrifolia** L. 2149.

574. Convallaria. Lily-of-the-valley. VI, 14.

1. Stem leafless. 2 elliptic rad. ls. Fls in an unilateral raceme.—Woods; everywhere. 5 . **majalis** L. 2150.

575. Polygónatum. Solomon's-seal. VI, 14.

1. Ls in whorls of 3—7, linear-lanceolate. Stem erect.—Woods of the mount., distrib. but not common. 5 **verticillatum** All. 2151.
- Ls altern., erect in two rows, oval-oblong or elliptic. Stem arched above, the ls directed upwards and the fls down 2
2. Peduncles bearing 3—5 fls. Filaments of the stas hairy. Stem cylindric. Varied with peduncles bearing rather large bracts; v. bracteatum Thom. (Bex!)—Woods; distrib. 5 **multiflorum** All. 2152.
- Peduncles gen. bearing 1—2 fls. Filaments of the stas glabr. Stem angular. Perianth twice as large as in the last. *Convallaria Polygónatum* L.—As the last. 5 **officinale** All. 2153.

OBS. *P. multiflorum-officinale* Zoll.

576. Smilacina. Smilacina. IV, 29.

1. Stem bearing 2 ls. Ls petioled, cordate-oval. Fls in a raceme, white. *Majanthemum bifolium* Schmidt.—Woods; everywhere. 5 **bifolia** Desf. 2154.

577. Ruscus. Ruscus. XXII, 12.

1. Small evergreen shrubs. Cladodes (leaf-like branches) oval, acuminate-apiculate.—Stony thickety places; Misox (Coaz). T. W. V. G. 3, 4 **aculeatus** L. 2155.

116. Dioscoreaceæ.

578. Tamus. Tamus. XXII, 21.

1. Stem climbing, flexible. Ls long-petioled, oval-heart-shaped, acuminate. Fls greenish, in axillary, often branched, racemes.—Woods; distrib. 5 **communis** L. 2156.

117. Liliaceæ.

579. *Túlipa*. Tulip. VI, 15.

1. Divisions of the perianth yellow. Filaments of the stas bearded at the base.—Meadows, fields, vineyards, in batches, but not very flourishing; (wanting in T. S. A.) 5
syvestris L. 2157.
- Divisions of the perianth deep purple (very rarely yellowish), marked at the base with a blackish blue spot, edged with yellow. Stas glabr. *T. maleolens* Grml. Excefl. 4th edition not Reb.—Fields; Sion. 4
Didieri Jord. 2158.

OBS. *T. Gesneriana* L. and other species are commonly cultivated in gardens.

580. *Fritillaria*. Fritillary. VI, 19.

1. Fls solitary, yellowish or flesh-coloured, chequered with square blood-red spots.—Damp meadows; Canton Neuchâtel in several places; otherwise very rare and in part probably subsontaneous. 4 . *Meleagris* L. 2159.
- OBS. *F. imperialis* L., the crown imperial, is often cultivated in gardens.

581. *Lilium*. Lily. VI, 25.

1. Fls drooping. Divisions of the perianth rolled back (like a turban), rose-coloured, spotted with brown.—Mountain woods; distrib. 6 *Martagon* L. 2160.
 - Fls erect. Divisions of the perianth erect, campanulate-infundibuliform, yellow-red, streaked with brown. Type of *L. bulbiferum* 2
 2. Axils of the upper ls containing bulbs.—Rocky places; G. (Fuldera, Lü, Tarasp). 6 *bulbiferum* L. 2161.
 - Axils of the ls without bulbs. Ls longer than in the last, with several nerves. Stem more angular.—As the last. T. W. J. U. A. Lägern. 6 *cróceum* Chaix. 2162.
- OBS. In gardens: *L. candidum* L., *L. Chalcedonicum* L. and others.

582. *Lloydia*. Lloydia. VI, 25.

1. Fls white, with 3 reddish streaks inside, yellowish at the base. Stem 1-fld.—High Alp. 7 *serótina* Rchb. 2163.

583. *Erythronium*. Dog's-tooth-violet. VI, 19.

1. Fls rose-coloured. Stem 1-fld. Ls 2, oblong-elliptic, spotted with red.—Thickety hills; Tess., Geneva. 3, 4
Dens canis L. 2164.

584. *Asphódelus*. Asphodel. VI, 23.

1. Fls white, in racemes. Stem leafless.—Mount. and subalp.; T. W. (Mt. Generoso; Riederhorn and above Lens). 5
albus Mill. 2165.

585. *Anthéricum*. *Anthericum*. VI, 23.

1. Stem terminated by a simple raceme. Peduncles jointed below the middle (the lowest joint $\frac{1}{4}$ — $\frac{1}{3}$ as long as the upper). Perianth 25—30 *mm* long.—Sunny hills, especially of the mount. and subalp.; distrib. but not common. 5, 6 *Liliago* L. 2166.
- Stem terminated by a branched panicle. Peduncles jointed very near to the base (the lowest joint much shorter than the uppermost). Perianth smaller.—As the last; distrib. 7 *ramosum* L. 2167.

586. *Paradisia*. *Paradisica*. VI, 27.

1. Fls 3—5, large (40—45 *mm* long), white. Ls radical, linear.—Pasturages of the Alp. and subalp., Dôle in the Jura. 7
Liliastrum Bert. 2168.

587. *Ornithógalum*. *Ornithogalum*. VI, 28.

1. Stas 3-fid at the top, the middle point bearing the anther. Fls large, white inside, in a simple, unilateral raceme with 5—9 fls.—Meadows, orchards; western Switz. Z. S. A. (wanting in the Alpine countries). 4, 5
nutans L. 2169.
- Stas not cleft 2
2. Fls greenish yellow, in a very long raceme, of 20 to 50 fls. Stem 50—80 *cm*. *O. sulfureum* Koch. (*O. sphærocarpum* Kern. = *O. pyrenaicum* Koch is not found in Switz.)—Thickety hills, hedges; Tess. and western Switz. 5
pyrenaicum L. 2170.
- Fls white in a short umbel-shaped raceme of 5 to 20 fls. Stem 15—25 *cm*.—Fields, grassy places; distrib. 4, 5
umbellatum L. 2171.

588. *Gágea*. *Gagea*. VI, 21.

1. Three oblique tubers, without a common covering. A single linear rad. leaf (rarely 2). Peduncles 2—3—5, glabr. *G. stenopetala* Fr.—Fields, grassy places; Geneva, Aargau, Zürich, Schaffh. 4 *pratensis* Schult. 2172.
- Tubers 2 or 1, straight 2
2. Tuber 1. A single rad. leaf, linear-lanceolate, flat (5—10 *mm* broad). Peduncles glabr.—Woods, hedges, orchards; distrib. 4 *lútea* Ker. 2173.
- Tubers 2, enclosed in a common covering 3
3. Rad. ls 1—2, hollow. Peduncles villous, rarely glabr. (*v. lævipes* = *G. intermedia* Schl.). Divisions of the perianth obtuse.—Damp places of the Alp. and subalp., especially near châteaux (wanting in T. A.). 5—6
Liottardi Schult. 2174.

- Rad. ls not hollow 4
 - 4. Peduncles fairly glabr. Rad. leaf 1 (rarely 2). Divisions of the perianth acuminate, the point curved outwards. Pl. delicate.—Alp. and subalp., rare: (wanting in O. U.) 6 **minima Schult.** 2175.
 - Peduncles villous. Rad. ls 2 5
 - 5. Fls 2—20. Divisions of the perianth acute. Rad. ls linear, channelled (about $2\frac{1}{2}$ —3 mm broad).—Fields, grassy places; scattered (wanting in O. U. L. A.). 4 **arvensis Dumort.** 2176.
 - Fls 1—5. Divisions of the perianth obtuse. Rad. ls linear-filiform, channelled or half-cylindric (1 — $1\frac{1}{2}$ mm broad). —Dry hills; lower and central Wall. 3 **saxatilis Koch.** 2177.
- OBS. Hybrid: *G. Liottardi-minima* (Brügg.).

589. *Scilla*. Squill. VI, 28.

- 1. Bracts reduced or 0. Ls 2, rarely 3.—Woods, hedges and orchards; not everywhere (wanting in S.). 4 **bifolia L.** 2178.
- Bracts existing. Ls 2—7 2
- Raceme composed of 2—5 fls. Bracts very short.—Orchards, rare (subspontaneous or naturalised); Bex, Bern, Solothurn, Schaffh. &c. 4 **amoena L.** 2179.
- Raceme many-fl'd. Some, at least, of the bracts as long as the peduncles.—As the last; Bern. 4 **italica L.** 2180.

590. *Allium*. Onion. VI, 26.

- 1. Filaments of the 3 inner stas tricuspidate, the central tooth bearing the anther 2
- Filaments of the stas all simple or the 3 inner ones with an obtuse, very short tooth at the base . . . 10
- 2. Ls flat 3
- Ls subcylindric or cylindric, hollow 8
- 3. Umbel with bulbils. (Stas shorter than the perianth. Ls broad-linear) 4
- Umbel without bulbils 6
- 4. Spathe with 2 valves, shorter than the umbel. Fls deep purple. The lateral teeth of the tri-cuspidate filaments long, filiform. Bulb surrounded by reddish brown, pedicelled bulbils. Ls scabrous at the edges. *A. arenarium* auct.—Hedges, grassy places; near Bâle, Geneva, Klingnau (Aargau). 6 **Scorodoprasum L.** 2181.
- Spathe undiv., prolonged in a beak much exceeding the umbel. Fls of a dirty white, sometimes almost 0. The lateral teeth of the tri-cuspidate filaments short, obtuse. Bulb surrounded by sessile, whitish bulbils. Type of *A. sativum* 5
- 5. Bulbils oblong-ovoid. Garlic. 6 . . . † **sativum L.** 2182.

- Bulbils ovoid-subglobular. 6 . . . † **Ophioscórondon** L. 2183.
- 6 (3). Spathe shorter than the umbel. Stas shorter than the perianth (enclosed). Ls narrow-linear. Accessory bulbils long-pedicelled, reddish brown (in *A. sphærocephalum* whitish).—Among the corn; Schaffh. (near Schleithelm, Siblingen, Neunkirch, Unterhallau, but varying in abundance in different years), also indicated near Porrentruy and Viège. 6 **rotundum** L. 2184.
- Spathe longer than the umbel. Stas slightly exceeding the perianth. Ls broad-linear. Pedicelled bulbils 0 7
- 7. Fls of a rosy white. Anthers reddish. Bulb gen. without bulbils. Leek. 6 † **Porrum** L. 2185.
- Fls of a purple-rose colour. Anthers yellow. Bulb with bulbils. 6 † **Ampelóprasum** L. 2186.
- 8 (2). Lateral teeth of the tri-cuspidate filaments long, filiform. Fls purplish. (Stas exceeding the perianth) 9
- Lateral teeth of the tri-cuspidate filaments short. Fls greenish white or lilac 13
- 9. The central tooth of the tri-cuspidate filaments longer than the entire part of the filament (divisions consequently below the middle). Ls almost cylindric, narrowly channelled. Umbel small, bulbiliferous, sometimes (*v. compactum*) with few or scarcely any fls, rarely (*v. capsuliferum*) without bulbils.—Fields, vineyards, slopes, by preference in western Switz. (wanting in U. A.) 6 **vinale** L. 2187.
- The central tooth of the tri-cuspidate filaments hardly half as long as the entire part of the filament (division consequently above the middle). Ls half-cylindric, broadly channelled. Umbel large, many-fl'd, without bulbils, spherical or (*v. descendens* auct. not L.) ovoid through the longer-pedicelled upper fls.—Stony hills; by preference in southern and western Switz. (wanting in L. Z. A. S.). 6 **sphærocéphalum** L. 2188.
- 10 (1). Ls flat, 20—50 mm broad, narrowed at the base into a distinct petiole 11
- Ls cylindric, half-cylindric, or flat, 7 mm broad at most, not petioled 12
- 11. Umbel globular. Fls greenish white. Stem leafy to the middle. Ls short-petioled. Bulbs sessile on an oblique or horizontal rt-stock, surrounded by a covering of netted fibres.—Rocky slopes of the Alp., subalp. and Jura. 6 **Victorialis** L. 2189.
- Umbel almost flat. Fls white. Stem leafless, only bearing 2 long-petioled ls at its base. Bulb oblong-linear, perpendicular, with a reduced rt-stock.—Hedges, damp thickets; distrib. 4 **ursinum** L. 2190.

12. Ls cylindric, acuminate, entirely hollow. Spathe not
acuminate, shorter than, or hardly as long as, the
umbel **13**
— Ls cylindric, channelled or flat, not hollow, or hollow,
but then the floral spathe is much longer than the
umbel **16**
13. Stem (as also the ls) inflated at or below the middle **14**
— Stem not inflated **15**
14. Filaments of the stas not toothed. Pedicels 3—4 times
as long as the fls. 6 † **fistulosum L.** 2191.
— Filaments of the 3 inner stas with a short tooth at the
base on each side. Pedicels about 8 times as long as
the fls. Onion. 6 † **Cepa L.** 2192.
15. Stas about as long as the perianth, the 3 inner ones
with a short tooth at the base on each side. Fls lilac.
Shallot. 6 † **ascalonicum L.** 2193.
— Stas shorter than the perianth, not toothed. Fls rosy
lilac. Ls slenderer than in the last.—b. *foliosum Clar.*
(*sibiricum auct. not L.*) Pl. taller; anthers lilac not
yellow.—The type is the pl. cultivated under the name
of chives; b. damp places of the Alp. and subalp., banks
of rivers in which it descends to the plains. 6
Schoenóprasum L. 2194.
16 (12). Spathe shorter than, or hardly as long as, the umbel.
Perianth infundibuliform-open (reddish) **17**
— Spathe longer than the umbel, one of the valves acu-
minate with a long point. Perianth slightly campanulate.
(Stem leafy in its lower third part) **20**
17. Bulb without a distinct rt-stock. Stem subcylindric, leafy
in its lower third part **18**
— Bulb little developed, sessile on an oblique or horizontal
rt-stock. Stem with acute angles, leafless (only leafy
quite at the base). Type of *A ngulosum L.* **19**
18. Filaments of the 3 inner stas enlarged at the base and
bearing on each side a very short, or (*A. Christii Janka*)
scarcely any, tooth. Coverings of the bulbs very fibrous.
A. suaveolens Gaud. not Jacq.—Rocky places; G. W.
(Engadine, Nicolaithal, Hermance). 6 **strictum Schrad.** 2195.
— Filaments of the stas not or indistinctly enlarged at
the base, not toothed. Coverings of the bulbs irreg.
cleft at the top.—Marshy fields; Hemmishofen: Sulger-
Büel; Wollmatingerried near Constance! Feldkirch. 7
suaveolens Jacq. 2196.
19. Stas as long as the perianth (enclosed) Stem 30—50 cm.
—Marshy fields, water-side; scattered (wanting in G. L.) 7
acutangulum Schrad. 2197.
— Stas longer than the perianth (protruding). Stem 20—25 cm.
A. serotinum Schl., A. fallax R. Sch.—Rocky places,

- up to the Alp.; fairly distrib. but not common. 7, 8
montanum Schmidt. 2198.
- 20 (16). Stas about as long as the perianth. Fls whitish green or dirty red. Ls almost cylindric, distinctly channelled.—*b. complanatum Fr.* (calcareum Reut.). Ls broader, flatter, hardly channelled.—Stony, thickety places, fields, road-sides; distrib. 7 . . . **oleraceum L. 2199.**
- Stas almost twice as long as the perianth. Fls of an almost uniform purplish lilac . . . **21**
21. Umbel few-fl'd, with bulbils. Ls flatter than in the last, faintly channelled. Divisions of the perianth hood-shaped at the top, truncate-obtuse, often emarginate.—Varied with ls (*A. flexifolium Jord.*) broader, and stas shorter.—As the last, but gen. rarer. 7 . . . **carinatum L. 2200.**
- Umbel several-fl'd, gen. without bulbils. Valves of the floral spathe narrower at the base than in the last. *A. paniculatum Gaud.* not L., *A. carinatum capsuliferum Koch.*—As the last; Graub., Tess., Vaud, Neuchâtel, Freibg. 7 . . . **pulchellum Don. 2201.**

591. *Hemerocallis*. *Hemerocallis*. VI, 13.

1. Fls very large, reddish yellow, scentless; divisions of the perianth nerved and veined transversely. Ls broad-linear.—Orchards, ditches; lower Rhone-valley in several places: Jaccard; also here and there, probably gen. subsontaneous. 6 . . . **fulva L. 2202.**
- Fls smaller, light yellow, perfumed; divisions of the perianth nerved, without transverse veins. Ls only half as broad as in the last.—As the last; near Bregenz, Lindau; near Lutry probably escaped from gardens. 6, rather earlier than the last . . . ***flava L. 2203.**

592. *Muscari*. *Muscari*. VI, 13.

1. Fls in an at first dense, then lax and much elongated (10–25 cm) raceme; the lower fls greenish brown, the upper barren with longer pedicels, of an amythiste blue as also the pedicels, clustered in a tuft.—Grassy slopes, fields; Graub., Southern and western Switz. 5 . . . **comosum Mill. 2204.**
- Racemes always dense (3–6 cm); the lower fls drooping, upper erect, more shortly pedicelled, all blue . . . **2**
2. Ls 2--3, spatulate-linear (broader towards the end), gen. shorter than, or only as long as, the stem. Fls scentless.—Orchards, slopes; not everywhere (wanting in A.). 3, 4 . . . **botryoides Dec. 2205.**
- Ls numerous, linear, gen. longer than the stem. Fls with a scent of plums. Type of *M. racemosum* . . . **3**

3. Valves of the capsule incised at the top. Perianth ovoid. Ls 2—3 mm broad, narrowly channelled above.—Grassy places, slopes; distrib. 4 . . . *racemosum* Dec. 2206.
- Valves of the capsule truncate at the top. Perianth ovoid-oblong. Ls 3—4 mm broad, more broadly channelled above. Pl. more robust in every way than the last.—Vineyards; V., Bâle, Winterthur and probably other places also. 4 *neglectum* Guss. 2207.

118. Colchicaceæ.

593. *Bulbocodium*. *Bulbocodium*. VI, 17.

1. Fls rose-coloured, rarely white, appearing with the ls. Pl. with the habit of *Colchicum*, but the 3 styles are united in 1 which is 3-fid at the top!—Meadows; W., from Pissevache to Viège: Jaccard; Mt. Vuache in Savoy. 2, 3 *vernum* L. 2208.

594. *Cólchicum*. *Meadow-crocus*. VI, 34.

1. Outer divisions of the perianth obovate-oblong. Ls oblong.—Rather damp meadows. 8, 9; the ls and fr. appearing the following spring; late fls without ls are rarely found in the following spring (v. *vernum*)
autumnale L. 2209.
- Outer divisions of the perianth linear-oblong. Ls linear-oblong.—Alp.; T. W. 7, 8 . . . *alpinum* Dec. 2210.

595. *Verátrum*. *Veratrum*. VI, 38.

1. Divisions of the perianth much longer than the pedicels, whitish inside or (b. *Lobelianum* Bernh.) greenish on both sides.—Pasturages of the Alp., subalp. and Jura. 7 *album* L. 2211.
- Divisions of the perianth as long as the pedicels, blackish red.—Tess. (S. Giorgio). 7 *nigrum* L. 2212.

596. *Tofieldia*. *Tofieldia*. VI, 39.

1. Pedicels with a 3-lobed, calyx-like invol. below the fl., and a bract at the base. Raceme more or less spike-shaped, elongated, rarely (in the Alp.) shortened to a head (b. *glacialis* Gaud.).—Damp pasturages and peat-mosses. 7 *calyculata* Wahlb. 2213.
- Pedicels with a 3-lobed invol. at the base, but without bracts. Raceme shortened to a head. T. borealis Wahlb.—High Alp., rare; G. W. Uri, Glarus. 7
palustris Huds. 2214.

119. Juncaceæ.

597. *Juncus*. Rush. VI, 31. III, 6.

1. Stem leafless (ls only rad. or entirely wanting) **2**
- Stem leafy (gen. few, often only 1 leaf) **10**
2. Anthela (apparently) lateral **3**
- Fls placed at the top of the stem **8**
3. Anthela many-fl'd **4**
- Anthela only 3 - 7-fl'd **7**
4. Rad. sheaths yellowish brown, dull. Stas 3. (Stems bright green with continuous pith) **5**
- Rad. sheaths blackish brown, shining. Stas 6 **6**
5. Style placed on a lump rising from the depression in the capsule. Stem (in the living pl.) finely streaked. Anthela gen. very compact (almost globular).—Marshy places; distrib. 6 **conglomeratus L. 2215.**
- Style placed in the depression of the capsule. Stem (when fresh) quite smooth (finely streaked after drying). Anthela laxer; less often (v. *compactus*) compact.—As the last. 6 **effusus L. 2216.**
6. Stem glaucous, deeply streaked, with an interrupted pith (slenderer and more tenacious than in the last). *J. inflexus* L.?—As the last; everywhere. 6 **glaucus Ehrh. 2217.**
- Stem bright green, the pith not or scarcely interrupted. *J. effusus-glaucus*!—As the last; rare. 6 ***diffusus Hopp. 2218.**
- 7 (3). Anthela placed almost in the middle of the stem. Perianth pale green or light brown.—Damp places of the Alp. and subalp. 6 **filiformis L. 2219.**
- Anthela placed in the upper part of the stem. Perianth blackish brown.—Alp.; G. W. (Upper Engadine; Saas, Zermatt). 7 **arcticus Willd. 2220.**
- 8 (2). Ann. pl. Divisions of the perianth finely acuminate, longer than the capsule.—Damp, sandy places; W. B. J. (Gombs, Seewyl, Bonfol). 6 **capitatus Weig. 2221.**
- Perenn. pls. Divisions of the perianth acute or obtuse, as long as, or shorter than, the capsule **9**
9. Fls 3 (2—4) together in an head surrounded by brown bracts. Stem slender, 8—12 cm.—Damp pasturages of the Alp. 7 **triglumis L. 2222.**
- Fls numerous, in a loose anthela. Stem stiff, 20—30 cm.—Alp.; only on the St. Gothard and the Isenau alp in the Ormonds, Vaud. 7 **squarrosus L. 2223.**
- 10 (1). Ls with a laciniate-ciliate ligule at the mouth of the sheaths. (Stem filiform, bearing 1—3 fls, fls with 2—3 very long bracts much exceeding the fls). Type of *J. trifidus* **11**

- Mouth of the sheaths not ciliate 12
- 11. Rad. ls (1—2) at least half as long as the stem.—Limestone Alps; U. A. (Rederten; Borenstein, Kamor, Kurfirsten, Val Medels. 1837.) 7 . . . **Hostii Tausch.** 2224.
- Rad. ls very short.—Alp. 7 **trifidus L.** 2225.
- 12. Fls in an isolated head, or in 2 heads one placed above the other, or in several heads forming together a many-fl'd anthela 13
- Fls isolated, in an anthela, in 2236 sometimes in clusters of 2 or 3 20
- 13. Stas 3. Anthela composed of few heads; heads often mixed with or replaced by clusters of ls. Stem 5—25 cm, gen. thickened at the base, erect, or (v. *uliginosus*) decumbent and rooting in the mud, or (v. *fluitans*) elongated and floating in the water.—Peat-swamps, rare; Villeneuve, Bâle, Stossthal, Hackenegg, Einsiedeln, Geissboden, Constance. 6 **supinus Mönch.** 2226.
- Stas 6 14
- 14. Heads gen. numerous (in the dwarf forms of 2229 and 2230 sometimes only 5—3). Ls cylindric or cylindric-compressed, divided by transverse partitions and, when dried, appearing outside noded-articulate. Sheaths without an appendage 15
- Heads isolated, or 2—3 one above the other. Ls without transverse partitions. Sheaths prolonged at each end to a scarious appendage 18
- 15. Divisions of the perianth greenish yellow, obtuse. Capsule 3-celled. Stem with sheaths at the base which are not prolonged into ls. Lateral branches of the anthela bent back.—Damp meadows, ditches; distrib. 6
obtusiflorus Ehrh. 2227.
- Divisions of the perianth brown or blackish (in shaded pls sometimes pale). Caps. 1-celled. Sheaths gen. all prolonged into ls 16
- 16. Divisions of the perianth all acuminate, the inner longer, the point slightly bent outwards. Caps. acuminate-mucronate. Heads gen. more numerous than in 2230, otherwise varying in size. Stem erect.—Damp meadows; distrib. but not common. 5 . . . **sylvaticus Reich.** 2228.
- Divisions of the perianth almost equal in length, the inner obtuse or short-mucronate 17
- 17. Branches of the anthela erect-spreading. Divisions of the perianth all obtuse, the outer short-mucronate. Sheaths of the ls with an acute keel. Stem erect.—Damp meadows, sandy shores, up to the Alp., not everywhere in the lower regions. 6 **alpinus Vill.** 2229.
- Branches of the anthela spreading or divergent. Divisions of the perianth all short-mucronate, the outer

- acute, the inner obtuse. Sheaths rounded. Stem gen. ascending.—Marshy places, near water; everywhere. 6
lamprocarpus Ehrh. 2230.
- 18 (14). Fls in a single blackish brown, 4—10-fl'd, head. Filaments of the stas at least shorter by one half than their anthers. Fl.-stems with a single linear-subulate l., sometimes very close to the head. Habit of a Schoenus.—Alp., not common. 7 **Jacquini L. 2231.**
- Fls in 1—2—3 heads placed one above the other. Filaments of the stas several times as long as their anthers. Stem with 1—3 ls **19**
19. Divisions of the perianth of a chestnut brown. Rt-stock creeping. Stem stiff.—Alp.; G. (Alp. Nova Val Gronda, Splügen). 7 **castaneus Sm. 2232.**
- Divisions of the perianth pale green. Rt-stock short. Stem slender.—Peat-mosses; only near Einsiedeln and at Geissboden near Zug. 7 **stygius L. 2233.**
- 20 (12). Perenn. pls with a short creeping rt-stock. Divisions of the perianth obtuse. Type of *J. compressus* **21**
- Ann. pls. Divisions of the perianth acute or subacute. Type of *J. bufonius* **22**
21. Divisions of the perianth scarcely $\frac{2}{3}$ the length of the caps.; caps. almost globular. Style about a half shorter than the ovary.—Damp pasturages, road-sides; distrib. 6
compressus Jacq. 2234.
- Divisions of the perianth almost as long as the caps.; caps. oblong-ovoid. Style almost as long as the ovary.—As the last; apparently almost exclusively on saline soil; indicated in Waldnacht, Canton Uri, at Heinzenberg, Graub.; and near Bregenz. 6 * **Gerardi Loisl. 2235.**
22. Branches of the anthela almost erect. Divisions of the perianth unequal in length, lanceolate, acuminate, greenish, longer than the, oblong, caps. Ligules obliquely truncate, not auricled.—b. *congestus Schousb.* Fls in clusters of 2 or 3.—Damp places, road-sides; distrib. 6
bufonius L. 2236. *)
- Branches of the anthela spreading. Divisions of the perianth almost equal in length, oval-lanceolate, acute, brownish, scarcely longer than the, almost globular, caps. Ligules distinctly 2-auricled.—As the last, rare; Tess., Bâle. 6 **Tenagéia Ehrh. 2237.**

*) **J. ranarius P. Song.** Divisions of the perianth shorter, the outer as long or hardly longer (in *J. bufonius* distinctly longer) than the caps. which is distinctly narrowed at the base, should be found on the banks of the Inn in the upper Engadine.—**J. sphærocarpus** is perhaps identical with *J. Tenagéia intermedius* Gaud.

598. *Lúzula*. Woodrush. VI, 31.

1. Fls solitary, separated from one another, pedicelled, arranged in an umbel-shaped anthela. Seeds with an appendage at the top 2
- Fls clustered, several (3—15) together, or forming spikelets, sessile. Seeds without, or with a scarcely visible, appendage at the top 4
2. Rt-stock creeping. Fls yellowish.—Woods of the mount. (wanting in L. S.). 5 *flavescens* Gaud. 2238.
- Rt-stock tufted. Fls brown 3
3. Adult rad. ls linear-lanceolate (6—10 mm broad). Appendages of the seeds curved like a sickle.—Woods; distrib. 3 *pilosa* Willd. 2239.
- Rad. ls linear (2—3 mm broad). Appendages of the seeds straight.—Woods; southern and western Switz. 4
- Forstéri Dec. 2240
- 4 (1). Fls clustered, in a compound anthela. Seeds without an appendage at the base 5
- Fls in spikelets which are arranged in a (simple) umbel-shaped anthela, or in a spike. Seeds with an appendage at the base 8
5. Fls yellow. Fl.-ls shorter than the branches of the anthela. Ls entirely glabr.—Granite Alp. (wanting in A.). 7 *lútea* Dec. 2241.
- Fls white or sometimes tinted with red. Fl.-ls as long as, or longer than, the branches of the anthela 6
- Fls brown or blackish. Fl.-ls shorter than the branches of the anthela 7
6. Anthela lax; fls whitish or (v. *rubella*) light copper-coloured, 3—3½ mm long, gen. in clusters of 3—5. L. *albida* Dec.—Woods; distrib. (Vaud rather rare). 6
- angustifolia* Garck. 2242.
- Anthela more dense; fls pure white, silvery, rarely rosy (v. *rubescens* Favrat), shining, more acute and larger than in the last (5 mm long), in fuller clusters.—Woods of the mount. (wanting in J. S.). 6
- nivea* Dec. 2243.
7. Ls linear-lanceolate (5—10 mm broad), hairy at the edges. Fls more or less dark yellowish brown. L. *maxima* Dec.—Woods of the mount. (wanting in S.). 5
- sylvatica* Bich. 2244. *)
- Ls linear (2—4 mm broad), bearded at the base. Fls blackish brown, smaller than in the last. L. *parviflora* Desv. (N. Beitr. I, 23.) is hardly different.—Alp. and subalp. 7 *spadicea* Dec. 2245.

*) *L. Sieberi* Tausch, with narrower ls, and few-fl'd anthela, is found in Switz. according to Celak.

- 8 (4). Spikelets clustered into a (single) oblong spike, lobed and drooping, of a blackish brown. Ls channelled.—Alp. and Dôle in the Jura. 6 . **spicata Dec.** 2246.
- Spikelets arranged in an umbel-shaped anthela (sometimes contracted into a lobed head). Ls flat. Type of *L. campestris* 9
9. Rt-stock stoloniferous. Stems gen. solitary or few, 10 to 20 cm high. Anthers, after shedding their pollen, 3—4 times as long as their filaments.—Pasturages, wood-sides; everywhere. 3 **campestris Dec.** 2247.
- Rt-stock without stolons. Stems gen. numerous, tufted, taller and stiffer than in the last. Anthers, after shedding their pollen, about as long as their filaments.—Varied with paler spikelets; also: b. *uliginosa Grml.* Stems several, slender; spikelets 5—6, peduncled or almost sessile; capsules blackish.—c. *alpina Hopp.* (nigricans Desv. not Pohl., *L. sudetica* auct. helv. not Presl. *) Stems lower, few or solitary; spikelets 3—5; ls almost glabr.—Wood-clearings (especially on silicious soil), sometimes with the last; b. peat-mosses; c. Alp. and subalp.; 4, later than the last . **multiflora Lej.** 2248.
- OBS. Hybrid: *L. angustifolia-nivea* (Jorat).

120. Cyperaceæ.

599. Cyperus. Cyperus. III, 73.

1. Perenn. pls. Stems 50—100 cm 2
- Ann. pls. Stems 5—20 cm 3
2. Stigs 2.—Marshes; Tess. 7 **Monti L.** 2249.
- Stigs 3.—Marshy meadows, water-side, rare; shores of the lakes of Lugano, Geneva, Brienz, Sarnen, Lucerne and Constance (Lindau). 7 **longus L.** 2250.
3. Stigs 2. Spikelets oblong-lanceolate, yellowish. Stem angular with obtuse angles.—Damp, inundated places; distrib. 7 **flavescens L.** 2251.
- Stigs 3. Spikelets narrower than in the last, blackish brown. Stems angular with acute angles.—As the last. 6 **fuscus L.** 2252.

600. Schoenus. Schoenus. III, 73.

1. Heads composed of 5—10 blackishbrown spikelets. Ls reaching to or exceeding the middle of the stem. Stems 30—50 cm.—Marshes; distrib. 5 **nigricans L.** 2253.

*) *L. sudetica* Presl. and *L. pallescens* Bess. are different species, inhabiting the north of Europe.

- Heads composed of 2—3 dark rusty brown spikelets. Ls not reaching the middle of the stem. Stems 15—30 *cm.*
—As the last. 5 *ferrugineus* L. 2254.

601. *Cladium*. *Cladium*. III, 76. II, 13.

1. Ls denticulate and cutting at the edges and on the keel. Stem 80—100 *cm.*—Marshes; not common (wanting in G. U. A.). 7 *Mariscus* R. Br. 2255.

602. *Rhynchospora*. *Breaksedge*. III, 76.

1. Spikelets brown. Bristles of the perianth rough, the hairs directed forwards. Rt-stock creeping.—Marshes, rare; T.Z.A. Ascona, Mt. Cenere; Hurden; Rheineck, Schloss Forstegg). 6 *fusca* R. Sch. 2256.
- Spikelets white (later rather reddish). Bristles of the perianth rough, the hairs directed backwards. Rt-stock tufted.—Marshes; here and there. 6 *alba* Vahl, 2257.

603. *Heleocharis*. *Heleocharis*. III, 78.

1. Stems quadrangular-furrowed, very slender, almost capillary (3—10 *cm.*). Stigs 3. Achenes with longitudinal ribs.—Inundated places, not common. 6 *acicularis* R. Br. 2258.
- Stem cylindric or slightly compressed (sometimes, especially when dry, slightly streaked). Stigs 2. Achenes without ribs 2
2. Perenn. pls (with almost ligneous, creeping, rt-stock). Floral scales subacute (except those at the base of the spikelet) 3
- Ann. (many-stemmed) pls. Fl. scales obtuse 4
3. The 2 lower (empty) scales only half-clasping the base of the spikelet. Stems rather dull (15—60 *cm.*).—Damp meadows, water-side; everywhere. 5 *palustris* R. Br. 2259.
- The lower scale entirely clasping the base of the spikelet. Stems shining, slenderer than in the last, easily turning yellow in drying.—Peat-mosses; distrib. but less common than the last. 6 *uniglumis* Schult. 2260.
4. Spikelets many-fl. Achenes yellowish, shorter than the bristles of the perianth. Stems 10—15 *cm.*—Inundated places, very rare; Cugnasco; Geneva; Neuchâtel (between Locle and the Col des Roches, if yet?), Pruntrut. 6 *ovata* R. Br. 2261.
- Spikelets few-fl. Achenes black, longer than the bristles of the perianth. Stems 3—5 *cm.* H. *atro-purpurea* Kunth? —On the damp sand by the lake of Geneva; only between St. Sulpice and les Pierrettes, not far from Lausanne. 7 *Lereschii* Thom. 2262.

604. *Scirpus*. *Scirpus*. III, 77.

1. Stem leafy. Ls linear, flat or slightly channelled, grass-like. (Inflorescence terminal) **2**
- Stem leafless. Ls 0, or 1 or 2 of the rad. ls bearing a more or less long, bristle-like or channelled leaf **4**
2. Spikelets numerous, in a distichous, compressed, spike. Stigs 2. Stem 10—20 *cm*.—Damp pasturages; distrib. 7 **compressus Pers. 2263.**
- Spikelets in clusters which are partly sessile partly peduncled, in the form of an anthela. Stigs 3. Stem 30—90 *cm* **3**
3. Spikelets small (3—5 *mm* long), blackish green, very numerous. Fl.-scales entire.—Wood-swamps, ditches; distrib. 6 **sylvaticus L. 2264.**
- Spikelets large (10—25 *mm*), reddish brown. Fl.-scales 2-fid at the top.—Water-side, rare; W. V. B. S. L. A. 7 **maritimus L. 2265.**
- 4 (1). Spikelets solitary, terminal, (stigs 3) **5**
- Spikelets several or many, apparently lateral **8**
5. The highest sheath terminated by a short leaf **6**
- Sheaths without ls **7**
6. Bristles of the perianth longer than the achenes. Stems 5—40 *cm*.—Damp pasturages and peat-mosses, especially of the mount. and subalp. (wanting in S.). 5 **cæspitosus L. 2266.**
- Bristles of the perianth 0. Stem 5—7 *cm*. The lower scale shorter than in the last. Rt-stock stoloniferous—Alp.; Engadine, Bregaglia; Simplon, valleys of Saas and St. Nicolas. 7 **alpinus Schl. 2267.**
7. Spikelets composed of 3—7 fls. Stems 5—20 *cm*, slender, without transverse partitions.—Marshy meadows; fairly distrib. 5 **pauciflorus Lightf. 2268.**
- Spikelets composed of 3—4 (very small) fls. Stems 3—5 *cm*, very slender, almost filiform, transparent, with transverse partitions inside.—Habit of 2258.—Inundated, sandy places, very rare; near Kriegstetten, Canton Soloth., and Urtenen, Canton Bern (yet?). 7 **parvulus R. Sch. 2269.**
- 8 (4). Spikelets in several (3—8) globular, very compact and apparently tomentose heads. Stems cylindric, 50 to 90 *cm*.—Shores; by the lake of Geneva. 7 **Holoschoenus L. 2270.**
- Spikelets not collected in globular heads, 2—several crowded in a single cluster; or several—many sessile or peduncled in an anthela **9**
9. Fl.-scales emarginate at the top, mucronate. Rt-stock creeping **10**
- Fl.-scales not emarginate. Pl. tufted **14**

10. Stem triangular throughout its entire length. (Stigs 2) **11**
— Stem entirely cylindric, rarely obtuse angled above **12**
11. Ls of the rad. sheaths short. Spikelets partly sessile,
partly peduncled. Fl.-scales with obtuse lobes. Stem
50–60 cm. S. triqueter auct. not L., S. Pollichii Gr.
Godr.—Marshes, shores, rare; W. V. B. Z. 6
trigonus Roth. 2271.
- Ls of the rad. sheaths elongated (10–15 cm long). Spike-
lets all sessile. Fl.-scales with acute lobes. Stem slenderer
than in the last. Invol.-bract longer. S. Rothii Hopp.—
Water-side; shores of the lakes of Neuchâtel and Bienne. 6
pungens Vahl. 2272.
12. Stem 50–100 cm, light green, obtusely 3-cornered above,
with 2 rather convex faces, the 3rd flat. Fl.-scales smooth
or with scattered, raised spots. Top of the anthers
glabr. Stigs 2. S. Duvalii Hopp., S. lacustris-trigonus or
Tabernæmontanus-trigonus (see N. Beitr. I, 48).—In-
undated places, very rare; Bouveret, Aarau, Brunnen?
Rheineck. 6, 7 ***carinatus Sm. 2273.**
- Stem entirely cylindric **13**
13. Stem (100–200 cm) bright green. Fl.-scales smooth. Stigs
gen. 3. Top of the anthers bearded. Achenes 3-cornered.
—**b.bodamicus Gaud.** (Custoris Heg.). Stem lower, ob-
tusely 3-cornered in the upper part; rad. sheaths pro-
longed into ls —Shores, in water; everywhere. 6
lacustris L. 2274.
- Stem glaucous, lower and slenderer than in the last.
Fl.-scales rough-spotted. Stigs 2. Top of the anthers
glabr. Achenes compressed-convex, smaller. Anthela
denser.—Inundated places; rarer than the last, but dis-
trib. 6 **Tabernæmontani Gmel. 2275.**
14. (9). Stem triangular (50–70 cm). Bristles of the perianth
present. Spikelets sessile Bract of the anthela very long,
spreading. Achenes wrinkled transversely!—Marshes,
rare; Locarno, Villeneuve, Noville, Fehraltorf and Gossau,
Canton Zürich, Frauenthal, Canton Zug, Rheineck. 7
mucronatus L. 2276.
- Stem cylindric (5–25 cm). Bristles of the perianth 0 **15**
15. Spikelets clustered (2–4 together) not far from the top
of the stem. Achenes with longitudinal ribs.—Damp
places, ditches; not common (wanting in S. and W.?). 7
setaceus L. 2277.
- Spikelets in clusters (of 3–5) near the middle of the
stem. Achenes transversely wrinkled.—Damp places on
the shores of the lake of Geneva. 7 **supinus L. 2278.**

605. *Fimbristylis*. *Fimbristylis*. III, 78.

1. Stem leafy. Spikelets 3—5. Achenes with longitudinal ribs and transverse wrinkles.—Tess. (Marsh between Cordola and Cugnasco). 7 . . . **annua** R. Sch. 2279.

606. *Eriophorum*. *Cottonsedge*. III, 74.

1. A single terminal spikelet 2
- Several (3—12) spikelets in an umbel-shaped anthela (unequally peduncled) 4
2. Bristles of the perianth (cottony hairs) few (3—6) in each fl., wavy. Stems triangular, rough. While flowering resembles *Scirpus cæspitosus*.—Peat-swamps, up to the Alp.; fairly distrib. 4 **alpinum** L. 2280.
- Bristles of the perianth numerous, straight. Stem smooth 3
3. Rt-stock fibrous, forming a dense tuft. Stem 3-cornered above. Spikelets ovoid.—As the last (wanting in S.). 4 **vaginatum** L. 2281.
- Rt-stock stoloniferous. Stem cylindric. Spikelets globular. — Peaty land of the Alp. 4, 5 **Scheuchzeri** Hopp. 2282.
- 4 (1). Peduncles glabr. Stem almost cylindric. Spikelets 3—7.—b. *alpinum* Gaud. (dubium Heg.) Spikelets less numerous; ls almost reduced to the triangular point.—Marshy meadows; distrib. 4 . . . **angustifolium** Roth. 2283.
- Peduncles rough. Stem obtusely 3-cornered 5
5. Ls linear-lanceolate, flat, terminating in a short triangular point. Spikelets 6—12, drooping when mature.—As the last. 4 **latifolium** Hopp. 2284.
- Ls narrow-linear, channelled-triangular. Spikelets 3—4, almost erect.—Peat-moss, not common. 5 **gracile** Koch. 2285.

607. *Elyna*. *Elyna*. XXI, 1.

1. Spikelets 2-fld, the lower fl. fem. and sessile, the upper male and pedicelled (like an androgynous fl.), together forming a spikelet.—High Alp. 6 **spicata** Schrad. 2286.

608. *Kobresia*. *Kobresia*. XXI, 1.

1. Spikelets 1-fld (sometimes with a second rudimentary fl.), in 4—5 short, linear spikes (spikelets), of which the lower are gen. only fem., the upper only male.—Alp.; G. W. V. O. 7 **caricina** Willd. 2287.

609. *Carex*. *Sedge*. XXI, 1. XXII, 1.

1. Spikelets solitary and terminal 2
- Spikelets several (but sometimes clustered in an head) 8

I. *Monostachyæ*.

2. Stigs 3. Spikelets androgynous 3
- Stigs 2. Spikelets unisexual or androgynous 6

3. Fr. apiculate through the base of the style. *C. myosuroides* Vill. = *Elyna*.
 — Fr. terminating in a beak 4
4. Fr. obovate, erect Glumes of the fem. fls. persistent.—
 Alp., rare; G. T. W. O A. 7 *rupestris* All. 2288.
 — Fr. lanceolate-subulate, bent down. Glumes deciduous 5
5. Spikelets composed of 10–12 fls. Fr. with a long green
 bristle at the base!—Alp., rare; G. W. Appenzell. 6
 *microglóchin* Wahlb. 2289.
 — Spikelets composed of 4–6 fls. Fr. with no bristle at
 the base.—Peat-swamps, especially of the Jura, rare in
 other parts (wanting in S.). 6 *pauciflora* Lightf. 2290.
- 6 (2). Spikelets androgynous. Fr. nerveless, narrowed at
 both ends Pl. loosely tufted with smooth stems.—Marshes;
 distrib. but not common. 5 *pulicaris* L. 2291.
 — Spikelets 1-sexual, rarely varied to androgynous. Fr.
 nerved, broader at the base 7
7. Pl. forming a dense tuft. Stems numerous (often as
 many as 100), rough above as also the edges of the ls.
 Fr. lanceolate, finally horizontal, the points turned down.
C. Custoriana Heer (f. androgyna).—Damp meadows;
 distrib. 4 *Davalliana* Sm. 2292.
 — Rt-stock creeping. Stems more isolated, smooth, as also
 the ls. Fr. oval, finally spreading, straight.—As the last,
 but much rarer (wanting in S.). 4 *dioica* L. 2293
- 8 (1). Spikelets all androgynous, *i. e.* gen. containing
 both male and fem. fls at the same time (in 2297 they
 are gen. 1-sexual) 9
 — Spikelets 1-sexual, *i. e.* some containing only male,
 others only fem. fls; the terminal, or the 2–5 upper
 spikelets are male, the others (lower) are fem.; the
 male spikelets rarely contain fem. fls at the top, or the
 fem. male fls at the base; in 2318, 2323–2327 the ter-
 minal spikelet is androgynous, with fem. fls at the
 base, the others are male 29

II. Homostachyæ.

9. Stigs 3 10
 — Stigs 2 11
10. Spikelets forming a head or dense oblong spike. Glumes
 acuminate.—High Alp.; fairly distrib., but not common. 7
 *cúrvula* All. 2294.
 — Spikelets forming a longer spike. Glumes not acuminate.
C. mirabilis = *Kobresia*.
11. Rt-stock producing elongated stolons 12
 — Rt-stock tufted, without, or with very short, stolons 15
12. Spikelets clustered in a globular or ovoid head. Stem
 smooth. (Spikelets bearing the male fls at the top) 13

- Spikelets arranged in a spike. Stem rough, at any rate above **14**
- 13. Stem much longer than the ls, branchy at the base! —Peat-bogs; in several places in the Jura, Schwarzen-eck, Bünzen, Einsiedeln, Robenhausen, Pfäffikon, Katzen-see. 5 **chordorrhiza Ehrh. 2295.**
- Stem as long as the ls, arched.—Granite Alp.; G. T. W. 6 **incurva Lightf. 2296.**
- 14. Spikelets brownish, 6—20 in number, gen. 1-sex., the middle ones with male fls, the upper and lower with fem. fls (but varied in this last respect!).—Marshes, water-side; gen. not uncommon (wanting in G. T. L.). 5 **disticha Huds. 2297.**
- Spikelets yellowish, gen. curved, almost distichous, 3 to 6 in number, androgynous, the fem. fls at the top, the male fls at the base.—Woods; in batches (wanting in G. W. U.). 5 **brizoides L. 2298.**
- 15 (11). Spikelets (green) clustered in a head which is sup-ported at the base by 2 foliaceous bracts which greatly exceed the head in length. Fr. terminated by a very long beak.—Dried up ponds; very rare and gen. change-able; indicated at Delle, Briger Bad (Wall.), Hallwyler-see. 7 **cyperoides L. 2299.**
- Spikelets in a spike or panicle, or also clustered in a head, but then without foliaceous bracts **16**
- 16. Spikelets with male fls at the top **17**
- Spikelets with fem. fls at the top **22**
- Spikelets with fem. fls at the top and the base, the upper spikelets with male fls in the middle, the whole forming an ovoid-oblong, dark red-brown spike. *C. foetida-lagopina?*—Alp.; W. (Todtensee on Grimsel), Simplon. 8. 9 **Laggéri Wimm. 2300.**
- 17. Spikelets clustered in a globular or ovoid head. Fr. acuminate with an elongated 2-toothed beak at the top. —Alp.; not common. 7 **foetida Vill. 2301.**
- Spikelets in a spike or panicle **18**
- 18. Fr. erect, compressed, nerveless, as long as the glumes. Spikelets brown.—High Alp., rare; W. V. O. 7 **microstyla Gay. 2302.**
- Fr. spreading, regularly convex on the back, longer than the glumes **19**
- Fr. erect, humped on the back, as long as, or shorter than, the glumes. (Spikelets brown, the glumes white-scarious at the edges) **20**
- 19. Stems stout, triangular with concave faces and very rough angles, at least above. Ls 5—9 mm broad. Fr. with 6—7 distinct nerves.—Damp places, ditches; distrib. 5 **vulpina L. 2303.**

- Stems feeble, with flat faces, the angles not so rough as in the last. Ls 2—4 mm broad. Fr. indistinctly nerved. —The following forms are good species: a. *contigua* Hopp. Spikelets crowded; glumes with brownish edges; stems fairly stiff, almost erect. b. *virens* Lam. (*C. divulsa* Gaud. not Good?) Spikelets more distant, paler; stems slenderer, at last drooping; later and flowering longer. —c. *Piræi* F. Schultz. Spikelets as in the var. b.; stems stiff, almost erect; ls narrow, very long, longer than the stems; ligule shorter; stems obtuse-angled, only rough above; fr. small, with a broader and shorter beak; flowering period as in b.—Road-sides, slopes; a. distrib.; b. less common, near Bern, Bâle and probably in other places; c. Orbe, Bâle. 5 . **muricata** L. 2304.
20. Fr. dull, nerved on both sides. Faces of the stems slightly convex. Rt-stock tufted with clustered fibres. —Marshes (wanting in T. W.). 5 **paradoxa** Willd. 2305.
- Fr. shining, without nerves or only faintly nerved at the base of the upper face 21
21. Stems stout, with flat faces. Ls rather broad. Panicle lax, with a grayish sheen.—As the last; distrib. 5 **paniculata** L. 2306.
- Stems feeble, with slightly convex faces. Ls narrow. Spikes gen. dense, only rather paniced at the base, without the grayish sheen.—As the last (wanting in T. S.). 5 **teretiuscula** Good. 2307.
- 22 (16). The 2—4 lower spikelets very distant, with elongated foliaceous bracts which exceed the stem.—Damp, shady places; distrib. 5 . . . **remota** L. 2308.
- Spikelets more or less crowded, with bracts which are scarious and do not exceed the stem 23
23. Fr. lanceolate, spreading. Spikelets oblong-cylindric, 8—12 in number, brownish. Stem triangular, rough.—Damp meadows; not common (wanting in G. T. W. A.). 5 **elongata** L. 2309.
- Fr. oval. Spikelets oval-oblong or globular 24
24. Fr. surrounded by a rough winged margin, prolonged up to the tip of the beak. Spikelets crowded, obovate, grayish brown, rarely (*v. argyroglochin* Horn.) whitish or yellowish.—Damp meadows, woods; distrib. 6 **leporina** L. 2310.
- Fr. without the winged margin 25
25. Fr. spreading-divergent, with a bidentate beak. Spikelets gen. 4, crowded. *C. stellulata* Good.—b. *grypus* Schk. Spikelets more crowded, darker; beak of the fr. bent inwards.—Damp meadows; distrib. 5 **echinata** Murr. 2311.
- Fr. erect-spreading 26
26. Spikelets 3—4, crowded. Fr. smooth 27

- Spikelets 4–8, the lower rather distant. Fr. finely streaked **28**
- 27. Stem smooth or only slightly rough under the spike. Fr. flat-convex. *C. approximata* Hopp.—High Alp. on granite; not common. 7 *lagópina* Wahlb. 2312.
- Stem rough, especially above. Fr. compressed-3-cornered. Peat-bogs; V. O. B. J. U. L. 6 **Heleonastes** Ehrh. 2313.
- 28. Spikelets greenish white, ovoid-oblong. Fr. with a very short, faintly notched, beak not cleft on the back.—Damp meadows; distrib. 5 *canescens* L. 2314.
- Spikelets brownish, ovoid-globular. Fr. with a short beak, cleft from end to end on the back. *C. Personii* Lang, *C. vitilis* auct.—Alp. 6 **brunescens** Poir. 2315.

III. *Heterostachyæ*.

- 29 (8). Stigs 2 **30**
- Stigs 3 **36**
- 30. Fr. terminated by a bi-dentate beak **31**
- Fr. glabr., with no beak at all, or with a cylindric beak, not toothed **32**
- 31. Fr. slightly hairy. Ls bristle-like, channelled, curved.—Alp.; G. T. A. 6 *mucronata* All. 2316.
- Fr. glabr. Ls narrow-linear, deeply channelled, compressed-flat at the top. *C. dioica-echinata*?—Marshes; Vevey, Amsoldingen, Cappel, Canton Zürich, Bregenz. 6 **Gaudiniana** Guthn. 2317.
- 32. Lowest bract sheathing. Spikelets 3, variegated with brown and green, the terminal one only bearing male fls at the base.—High Alp., rare; G. T. W. V. U. 7 **bicolor** All. 2318.
- Bracts without, or with very short, sheaths **33**
- 33. Rt-stock thickly tufted, without stolons. Sheaths of the ls all, or at least the lower ones, worn into ragged fibres. Stems bearing at the base leafless sheaths and, rather higher, ls. Type of *C. cæspitos* **34**
- Rt-stock producing more or less long stolons. Sheaths of the ls (gen.) not worn into ragged fibres. Stems with ls from the base. Type of *C. acuta*. **35**
- 34. Ls glaucous; sheaths yellowish brown. Fr. compressed, strongly nerved. Stems 40–60 cm. Pl. forming thick strong mats.—Marshes; water-side; distrib. 4 **stricta** Good. 2319.
- Ls light green (almost yellowish); sheaths blackish red. Fr. convex on both sides, without, or with faint, nerves. Stems lower, slenderer, limp. *C. pacifica* Drej.—As the last; indicated near Locle, and between Burgdorf and Strättlingen. 4 **cæspitosa* L. 2320.

35. Male spikelets 2—4 (rarely only 1); fem. spikelets elongated-cylindric, lax below, finally drooping. Lower bract exceeding the top of the terminal male spikelet. Ls gen. grass-green, broad, the edges gen. rolling back when dried. Stem 40—100 *cm*. *C. paludosa* differs in having 3 stigs, and in the bidentate beak of its fr.—Varied with long-acuminate glumes exceeding the compressed fr.: v. *prolixa* Fr.—Marshes, water-side; scattered (wanting in G. W.). 5 . . . *acuta* Fr. 2321.
- Male spikelet 1, rarely 2; fem. spikelets oblong-cylindric, erect. Lower bract not exceeding the top of the male spikelet. Ls gen. glaucous, rather narrow, gen. rolled inwards when dried. *C. vulgaris* Fr.—Varied: Spikelets variegated with black and green, or glumes almost entirely hidden by the fr., the spike, consequently, of a green colour (v. *chlorocarpa* Wimm.), or glumes and the free part of the fr. blackish (v. *melaena* Wimm.); also b. *juncella* Fr. Stem taller, slenderer, stiff-erect; ls only half as broad.—Damp meadows; distrib. 4
- Goodenowii Gay. 2322. *)
- 36 (9). The terminal spikelet androgynous, the male fls below and the fem. fls above, the other spikelets are female 37
- The terminal spikelet containing male fls 41
37. L.-sheaths reddish, wearing into netted filaments. Glumes of the fem. spikelets brown with a green middle nerve. Rt-stock stoloniferous.—Damp meadows, rare; G. V. B. Z. 5 *Buxbaumii* Wahlb. 2323.
- L.-sheaths brown, entire. Glumes black or blackish violet. Rt-stock tufted 38
38. Spikelets short, globular or ovoid, closely pressed against each other. Lower bract scarious or narrow-foliaceous 39
- Spikelets all, or at least the fem. ones, oblong, only crowded, the lower spikelet more distant and longer-peduncled. Lower bract foliaceous. Type of *C. atrata* 40
39. Stem rough above. Spikelets small (7—9 *mm* long). Fr. greenish, *C. alpina* Sw.—Alp.; G. (Upper Engadine in various places, Albula). 7 *VahlII* Schk. 2324.
- Stem smooth (10 *cm*). Spikelets larger (8—12 *mm*). Fr. blackish violet.—High Alp. 7 *nigra* All. 2325.
40. Stem smooth (20—40 *cm*). Fr. greenish.—Alp. 7
- atrata* L. 2326.

*) *C. Dematranea* Lagg. (Seedorf) is allied to *C. elytroides* according to Fries, to *C. limula* according to Christ.—*C. turfosa* Fr. with a taller, stiffer stem, and the lower l.-sheaths rather net-fibred (*C. stricta* differs in its thickly tufted rt-stock) is indicated near Lustorf, Canton Freiburg., and on the St. Bernard.

- Stem rough (still higher). Fr. blackish violet, green at the edges and base.—Prim. Alp., rather rarer than the last. 7 **aterrima Hopp. 2327.**
- 41 (36). A single terminal male spikelet **42**
- 2 or several male spikelets (in impoverished pls sometimes only 1) **79**
- 42. Fr. glabr. (in 2345, 2353 and 2354 rather short-pubescent) **43**
- Fr. covered with a dense pubescence or roughness (in 2357 rarely almost or entirely glabr.) **69**
- 43. Ls or l-sheaths hairy **44**
- Ls and l-sheaths glabr. **45**
- 44. Rt-stock stoloniferous. Ls of the flowerless leaf-clusters broad, ciliate, finally exceeding the, almost leafless, stem. Fem. spikelets linear, very lax, distant.—Woods, in patches, but not everywhere; V. B. J. Z. S. A. 6 **pilosa Scop. 2328.**
- Rt-stock not stoloniferous. Ls narrow, the lower ones and their sheaths hairy. Fem. spikelets oblong-ovoid, dense, crowded.—Woods; distrib. 5 **pallescent L. 2329.**
- 45. Rt-stock tufted, without stolons **46**
- Rt-stock creeping **60**
- 46. Fem. spikelets dense **47**
- Fem. spikelets lax **56**
- 47. Fem. spikelets finally drooping **48**
- Fem. spikelets always erect **50**
- 48. Fr. terminating in a long beak, almost as long as the rest of the fr., compressed, 2-fid, with diverging teeth. Glumes subulate.—Marshes, not common (wanting in G. T. U.). 6 **Pseudocyperus L. 2330.**
- Fr. terminating in a short beak, 3-cornered or cylindric, incised or shortly 2-lobed **49**
- 49. Fem. spikelets 4—6, distant, elongated-cylindric (10 cm and more), slender. Glumes of a pale rusty brown. Fr. pale green. Stem 90—120 cm. Ls 10—14 mm broad. C. maxima Scop.—Damp woods, here and there (wanting in G.). 6 **péndula Huds. 2331.**
- Fem. spikelets 2—3, rather crowded, ovoid or ovoid-oblong. Glumes and fr. blackish brown. Stem 20 to 30 cm.—Alp., very rare; G. W. O. (Fimberpass, valleys of Hérens and Bagne, Rawyl). 7 **ustulata Wahlb. 2332.**
- 50 (47). Bracts with short sheaths, or the lower bract supporting a more distant spikelet and with a longer sheath, much exceeding the male spikelet; gen. spreading horizontally or bent back at the last. Fem. spikelets ovoid or globular when mature. L-sheaths without appendages. Type of *C. flava* **51**

- Bracts with long sheaths. Reaching to or hardly exceeding the male spikelet, erect-spreading or erect. Fem. spikelets ovoid-oval-oblong or cylindric **52**
- 51. Fr. ovoid-elliptic, narrowed insensibly to a long beak which is curved downwards. Ls light green (almost yellowish).—Damp places, everywhere. 5 **flava** L. 2333.
- Fr. smaller than in the last, globular-obovate, contracted suddenly to a short, straight beak. Ls of a darker green, gen. narrower. Stem gen. lower but sometimes as much as 40 cm.—Inundated and peaty places; distrib. 5 **Oedéri** Ehrh. 2334.
- An intermediate form between the 2 last. Fr. almost globular-ovoid, smaller, narrowed less insensibly than in *C. flava* to a shorter, less curved beak. Stem slenderer, rather rough above; the male spikelet gen. peduncled.—As the last, but rarer . . . **lepidocarpa** Tausch. 2335.
- 52. Fr. oblong-lanceolate. L-sheaths without appendages. Stem almost leafless. Glumes brown. Ls short, stiff, broad, spreading in 3 rows.—Dry and rocky places in the calc. Alp. 6 **firma** Host. 2336.
- Fr. ovoid or almost globular. L-sheaths with a scarious appendage opposite to the limb of the leaf. Glumes greenish or light brown **53**
- 53. Fr. almost without nerves, wrinkled-spotted, smaller than in 2338; beak smooth, at the edges also, shortly 2-dentate. Habit of 2339.—Damp places in transalpine Switz. 4, 5 **punctata** Gaud. 2337.
- Fr. with longitudinal nerves; beak finely rough-toothed at the edges, 2-fid **54**
- 54. Fem. spikelets all very distant on the upper half of the stem, or the lowest placed rather lower. Glumes light brown, shortly mucronate by the middle nerve exceeding the limb. Teeth of the beak with small prickles on the inner edges. Stem almost smooth.—Damp meadows; distrib. 5 **distans** L. 2338.
- Fem. spikelets less distant from one another, gen. placed in the upper quarter of the stem, or the lowest spikelet only slightly lower. Glumes of a rusty brown, obtuse, not mucronate. Teeth of the beak smooth on the inner edge. Stem often rather rough above. Type of *C. fulva* Good **55**
- 55. The lower bract not reaching the male spikelet. Fr. erect-spreading. Stem smooth or slightly rough above.—Damp meadows; distrib. 5 **Hornschuchiana** Hopp. 2339.
- The lower bract reaching, or exceeding, the male spikelet. Fr. standing thicker than in the last, more inflated, more spreading in the lower part of the spikelet, gen. empty. Pl. of a more yellowish green; stem rougher:

- C. fulva* auct., *C. flava*-Hornschuchiana A. Br.—As the last, rarer. 5 * **xanthocarpa** Degl. 2340.
- 56 (46). Ls 5—8 mm broad. Spikelets remarkably slender and lax, drooping. Fr. narrowed to a long, thin, deeply 2-fid beak.—Woods; distrib. 6 . . . **sylvatica** Huds. 2341.
- Ls 1—3 mm broad 57
57. Fem. spikelets crowded almost in the form of an umbel. Fr. with a short, cylindric, obliquely truncate beak.—Alp.; 6 **capillaris** L. 2342.
- Fem. spikelets distant. Fr. narrowed to a margined beak which is flat above 58
58. Fr. (only 3—5 in a spikelet) elliptic-obovate, inflated, with numerous nerves, abruptly acuminate in a linear beak. *C. ventricosa* Curt.—Woods; indicated near Delle (near Pontarlier!). 5 **depauperata** Good. 2343.
- Fr. more numerous, lanceolate, narrowed more insensibly into a beak which is 2-toothed at the top 59
59. Ls setaceous (only 1 mm broad). Male spikelets linear. Fr. with a glabr. beak.—Rocky places in the Alp., subalp. and Jura. 6 **tenuis** Host. 2344.
- Ls flat (2—3 mm broad). Male spikelets narrow-clavate. Fr. with a ciliate, fine spiny beak. Spikelets thicker and bracts longer than in *C. ferruginea*; rt-stock not creeping.—Dry places in Alp., subalp. and Jura. 6 **sempervirens** Vill. 2345. *)
- 60 (45). Beak short or indistinct, truncate or shortly 2-lobed 61
- Beak with a margin, flat above, distinctly 2-toothed 67
61. Fem. spikelets dense 62
- Fem. spikelets lax 64
62. Fem. spikelets erect. Bracts sheathing, the upper scarious, ending in an herbaceous, green point. Fr. globular-ovoid, shining, nerved-streaked. *C. obesa* All.—Dry slopes: W. V. 6 **nitida** Host. 2346.
- Fem. spikelets drooping or suspended on a long, slender peduncle. Bracts foliaceous, not sheathing or the lowest with only a short sheath. Fr. oval or elliptic, compressed. Type of *C. limosa* (specimens of *C. glauca* with a single male spikelet are distinguished by the broader ls and cylindric fem spikelets) 63
63. Ls very narrow, channelled-folded, rough at the edges almost from the base. Fr. many-nerved.—Peat-swamps, here and there (wanting in T. W.? S.). 5 **limosa** L. 2347.
- Ls flat, smooth, rough at the edges towards the top. Fr. without or with faint nerves.—Alp. 6 **irrigua** Sm. 2348.
- 64 (61). Fem. spikelets 3—6, very slender, drooping. Pl. resembling *C. sylvatica*, but distinguished by its nerved

*) The var. **tenax** Reut. is, according to Christ, found in Graub. (Flimsenstein).

fr., without a beak or narrowed to a very short truncate beak.—Damp woods; Olsberg near Bâle, Laufenburg, Gütsch near Lucerne, Frauenthaler Klosterwald; formerly near Schöftland where it has been exterminated. 5

strigosa Huds. 2349.

— Fem. spikelets 1—3, erect **65**

65. Glumes whitish. Bracts scarious, not foliaceous. Ls narrow.—Woods; distrib. but not common. 4

alba Scop. 2350.

— Glumes brown. Bracts foliaceous **66**

66. Ls glaucous. Fr. with a short, obliquely truncate beak.

—Damp meadows; everywhere. 4 . . . **panicea** L. 2351.

— Ls green. Fr. with a longer, incised beak. Sheaths of the bracts looser than in the last. *C. vaginata* Tausch.

—High Alp.; upper Engadine; O. (Schwabhorn). 6

sparsiflora Stend. 2352.

67 (60). Stem rough. Fem. spikelets erect.—Alp.; G. W. (Canziano, Zermatt). 7 . . . **hispidula** Gaud. 2353.

— Stem smooth. Fem. spikelets drooping finally . . . **68**

68. Fem. spikelets distant, linear, all long-peduncled, rather lax.—Damp places in the Alp. and subalp., also lower; Creux du Van and Dôle, in the Jura. 5

ferruginea Scop. 2354.

— Fem. spikelets oblong, dense, the upper ones crowded and almost sessile.—Alp. and subalp. 7 **frigida** All. 2355.

69 (42). The top of the male spikelet reached or exceeded by the top of the upper fem. spikelet. (Stem surrounded at the base by sheaths without ls or only terminated by a short point; fem. spikelets lax, linear.) Type of *C. digitata* **70**

— The tips of the fem. spikelets not reaching the top of the male spikelet **71**

70. Fr. as long as, or slightly longer than, the glumes. Sheath of the upper ls red-brown.—Woods; distrib. 4

digitata L. 2356.

— Fr. distinctly longer than the glumes. Pl. gen. smaller than the last, forming a dense tuft. Upper sheath green, often terminating in a more distinct and slightly spreading limb. Spikelets shorter, more crowded than in the last.—Varied with glabr. fr. (v. *alpina*). *)—Grassy slopes, road-sides; distrib. 4 . . . **ornithopoda** Willd. 2357.

71. Spikelets all separated from one another by more than their length **72**

— Spikelets, at least the upper ones, more or less crowded **73**

*) *C. ornithopodioides* Hausm. (*reclinata* Fach.) has also glabr. fr. but differs in having blackish brown glumes, and the limbs of its caul. ls developed. It is found, according to Christ, in Canton Glarus.

- Ls channelled, hardly broader than the stem, glabr. Bracts without or with short sheaths **72**
- 81. Fr. without nerves, with a very short, indistinctly emarginate, beak. Type of *C. glauca* **82**
- Fr. distinctly nerved, with a distinct, 2-fid beak **83**
- 82. Fem. spikelets cylindric, long-peduncled, drooping, more rarely short peduncled and erect. Stem gen. glabr. Ls glaucous.—Marshy places, road-sides; everywhere. 4 **glauca Murr. 2368.**
- Fem. spikelets clavate, thicker towards the top. Otherwise as in the last, but fr. longer.—Alp., rare or overlooked. 5, 6 **clavæformis Hopp. 2369.**
- 83. Male spikelets yellowish, pale, cylindric, slender. Fr. convex on both sides, inflated; teeth of the beak elongated, much narrowed, diverging **84**
- Male spikelets dark brown, thicker. Fr. compressed or conic-3-cornered; beak rather short, with triangular prominent teeth **85**
- 84. Stem with obtuse angles, entirely smooth (only rough in the inflorescence). Ls slightly glaucous, narrow (2—4 mm broad, rarely more). *C. rostrata* With.—Marshes, water-side; distrib. 5 **ampullacea Good. 2370.**
- Stem with acute angles, rough on the angles. Ls broad (6—8 mm), grass-green.—As the last. 5 **vesicaria L. 2371.**
- 85. Lower glumes of the male spikelets obtuse (rarely all acute). Stem 40—90 cm. *C. Kochiana* Dec. (Glumes of the fem. spikelets long-pointed). *C. acutiformis* Ehrh. —Ditches, water-side; distrib. 5 . **paludosa Good. 2372.**
- Glumes all narrowed to a fine point. Stem 60—120 cm. Marshy meadows, water-side; not common (wanting in G. T. U. L.). 5 **riparia Curt. 2373.**

OBS. Hybrids: *C. brizoides-remota* (Ohmülleriana O. F. Lang); *C. muricata-remota* (axillaris Good.).

121. Gramineæ. (Grasses.)

610. Andropógon. Andropogon. III, 23.

1. Spikes 5—10, fascicled-digitatè, hairy, rather long-awned.—Stony places, hill-sides, distrib. 7 **Ischæum L. 2374.**

611. Pollinia. Pollinia. III, 44.

1. Spikelets in a panicle, 3 together at the tips of the branches, with a crown of reddish yellow hairs at the base. *Andropogon Gryllus* L.—Meadows and dry pasturages; transalpine Switz. W. V. 6 **Gryllus Sprgl. 2375.**

612. *Heterópogon*. *Heteropogon*. III, 13.

1. Spikelets in a simple, dense spike. Awns 6 *cm* long, twisted like a cord above. *Andropogon Allionii* Dec. —Rocks; T. 8 *Allionii* R. Sch. 2376.

613. *Tragus*. *Tragus*. III, 26.

1. Spikelets in a linear panicle, contracted in the form of a raceme, with small hooked prickles. Ls thickly ciliate.—Sandy places. W. 6 *racemosus* Desf. 2377.

614. *Oplismenus*. *Oplismenus*. III, 12.

1. Stem and l.-sheaths with long hairs. Ls broad (8—12 *mm*), wavy. *Panicum undulatifolium* Ard.—Shady places in Tess. 7 *undulatifolius* Beauv. 2378.

615. *Digitaria*. *Digitaria*. III, 23.

1. Ls and sheaths almost always glabr. Spikelets elliptic. *Panicum glabrum* Gaud.—Cultivated places, road-sides; scattered, rather rare and variable. 7
filiformis Koel. 2379.
- Ls and sheaths more or less covered with long hairs. Spikelets oblong-lanceolate, narrower than in the last. Type of *D. sanguinalis* 2
2. Lower empty glumella ciliate with stiff hairs on the lateral nerves.—As the last; Tess., Thun, Solothurn, Schaffh. &c. 7 *ciliaris* Koel. 2380.
- Lower empty glumella not ciliate.—As the last; distrib. 7
sanguinalis Scop. 2381.

616. *Echinóchloa*. *Echinochloa*. III, 45.

1. Spikelets shortly peduncled, arranged in false, unilateral spikes, paniculate in general outline; glumes awned or not. *Panicum Crus galli* L., *P. Crus corvi* Heg. (smaller form).—Road-sides, manure-heaps; everywhere. 7
Crus galli Beauv. 2382.

617. *Pánicum*. *Panicum*. III, 46.

1. Branches of the panicle rather thick. Stem 40—100 *cm*. —Cultivated and sometimes subspontaneous. 7
† miliaceum L. 2383.
- Branches of the panicle capillary. Stem 20—50 *cm*. —Cultivated for ornament and sometimes subspontaneous. 8
† capillare L. 2384.

618. *Setária*. *Setaria*. III, 27.

1. Bristles (and the upper part of the stem rough with small prickles directed downwards, so that the pl.

easily clings. Panicle spiciform, gen. interrupted and as if formed of whorls at the base.—Cultivated land, rubbish-heaps, road-sides; not common (wanting in U. S.). 6

verticillata Beauv. 2385.

- Bristles (and the upper part of the stem) more or less rough with small teeth directed upwards, so that when stroked upwards the spiciform panicle appears smooth and does not cling 2

- 2. Glumellas of the fertile fls strongly wrinkled transversely. Spikelets larger than in *S. viridis*. Bristles of a russet yellow. Stem almost smooth below the panicle, the ls also less rough than in *S. viridis*.—As the last, distrib. 6, 7

glauca Beauv. 2386.

- Glumellas of the fertile fls smooth or fairly smooth (only finely wrinkled transversely under the lense) 3

- 3. Spiciform panicle large, the thickness of a finger, lobed, drooping at maturity. Stem erect, 80—100 cm.—*b. minor* (*germanica* Beauv.). Pl. smaller, resembling the following; ls narrower. Axis of the panicle villous with long hairs.—Cultivated (originally from the east Indies). 7

†italica Beauv. 2387.

- Spiciform panicle slenderer, erect. Stems 20—50 cm, ascending 4

- 4. Spiciform panicle dense, not interrupted. Bristles numerous (green or, when exposed to the sun, tinted with violet).—Cultivated places, rubbish-heaps, road-sides. 6

viridis Beauv. 2388.

- Spiciform panicle interrupted at the base (almost as in *S. verticillata*, and only differing from it in the small teeth being directed upwards). Bristles not very numerous.—As the last, but rare and probably introduced from the south of Europe; near Lugano, Geneva, Rolle, Aarburg, Bâle, Schaffh. &c. 6 . . . **ambigua Guss. 2389.**

619. *Oryza*. *Oryza*. III, 43.

- 1. Panicle often not developed and hidden in the upper sheath. Ls very rough at the edges through the effect of small prickles directed downwards at the base of the leaf, upwards near the tip. *Leersia oryzoides* Soland.—Swamp ditches, water-sides; distrib. but not common. 8

clandestina A. Br. 2390.

620. *Phalaris*. *Phalaris*. III, 31, 47.

- 1. Spikelets arranged in a panicle which is gen. tinted with red and spreading during the flowering period. Glumes not winged.—Ditches, water-sides, distrib.; a variety having the ls streaked longitudinally with white (*v. picta*, ribbon-grass) is cultivated in gardens, rarely wild. 6 **arundinacea L. 2391.**

- Spikelets arranged in a dense spiciform panicle, whitish with 2 green streaks on each side. Glumes with a winged keel.—Cultivated (to feed canaries). 6 † *canariensis* L. 2392.

621. *Hieróchloa*. *Holygrass*. III, 53.

1. Spikelets in a spreading panicle, brownish yellow.—Water-sides, very rare; near Zürich (on an island in the Limmat between Altstetten and Höngg) and near Einsiedeln. 4, 5 *borealis* R. Sch. 2393.

622. *Anthoxanthum*. *Anthoxanth*. II, 13. III, 32.

1. Spikelets arranged in a loose spiciform panicle. Pl. when dry, giving off a scent of woodruff.—*b. alpinum* Gaud. (*longearistatum* Celak?). Ls glabr.; awns much longer. (Alp. and descending to the plains in Tess.)—Meadows, pasturages; everywhere. 4 *odoratum* L. 2394.

623. *Alopecúrus*. *Fox-tail*. III, 29.

1. Spiciform panicle narrowed at both ends. Glumes very shortly ciliate on the keel.—Fields of the Swiss plateau. 6 *agrestis* L. 2395.
- Spiciform panicle cylindric, obtuse 2
2. Glumes united almost to the middle. Stems erect, or only jointed-ascending at the base, 40—100 *cm.*—Damp meadows; not common and partly only introduced (wanting in T. W.). 5 *pratensis* L. 2396.
- Glumes only united by the base. Stems prostrate at the base, then jointed-ascending, or floating (in the water). Type of *A. geniculatus* 3
3. Spikelets 3 *mm*, obovate. Anthers light brown after flowering.—Marshy ditches; not everywhere (wanting in G. T. L.). 5 *geniculatus* L. 2397.
- Spikelets 2 *mm*, oblong-elliptic (slightly contracted above). Awn inserted about the middle of the glumella, not, or scarcely, exceeding the glumes. Anthers orange-yellow after flowering.—As the last; fairly distrib. 5 *fulvus* Sm. 2398.

624. *Phleum*. *Cat's-tail-grass*. III, 32.

1. Spiciform panicle thinner above, showing, when bent, a lobed ramification. Spikelets with a rudimentary second fl. in the form of a small pedicel placed at the base of the upper glumella. *Chilochloa* 2
- Spiciform panicle obtuse, remaining cylindric when bent. Spikelets without a second rudimentary fl. 4
2. Glumes wedge-shaped, almost horizontally truncate, thickened at the top, the keel rough-tubercular. Ann. pls. Stems 15—25 *cm*, lower than in the following, leafy

- almost up to the panicle.—Waste ground, fallow-ground, not common; T. W. V. L. Z. S. 5 **ásperum** Jacq. 2399.
- Glumes linear-oblong or lanceolate. Perenn. pls 3
3. Glumes linear-oblong, spotted-tubercular, the keel not, or more or less, long-ciliate. As the last; not everywhere (wanting in U. L. A.). 6 **Boehméri** Wib. 2400.
- Glumes lanceolate, smooth, long-ciliate, on the keel. Ph. hirsutum Sut.—Alp. and Jura. 7 **Michellii** All. 2401.
- 4 (1). Sheath of the highest leaf not, or scarcely, inflated. Awn $\frac{1}{3}$ — $\frac{1}{2}$ (rarely almost of the same length) as long as the glume.—b. *nodosum* L (intermedium Jord., intermediate between the var. and the type). Stem thickened in a tubercle at the base; spiciform panicle shorter.—Meadows, pasturages, everywhere; b. very dry places. 6 **pratense** L. 2402.
- Sheath of the highest l. slightly swollen-inflated. Awn as long, or almost as long, as the glume. Spiciform panicle dull violet, gen. shorter than in the last, thick, ovoid or slightly cylindric.—b. *commutatum* Gaud. Awn not ciliate; sheath of the highest leaf longer than the limb.—Alp., subalp. and Jura. 6 **alpinum** L. 2403.

624a. **Mibora. Mibora.** III, 20a.

1. A tufted, dwarf grass. Spikelets gen. of a reddish violet tint. *Chamagrostis minima* Borkh.—Andelfingen: Bächtold. 3, 4 **minima** Desv. 2403.b

625. **Cynodon. Cynodon.** III, 22.

1. Rt-stock long-creeping, jointed, which, together with the exactly digitate false spike, allows it to be easily distinguished from the genus *Digitaria*.—Sandy, waste ground, road-sides; T. W. V. J. U. Z. 7 **Dáctylon** Pers. 2404.

626. **Milium. Milium.** III, 51.

1. Panicle loose, spreading. Spikelets small, on capillary branches. Ls broad.—Woods; distrib. 5 **effusum** L. 2405.

627. **Stipa. Stipa.** III, 35.

1. Awn 20—30 cm long, plumose.—Dry hills and rocky places along the Alpine chain. 5 **pennata** L. 2406.
- Awn 10—15 cm long, rough (not plumose).—As the last; G. W. V. 6 **capillata** L. 2407.

628. **Lasiagrostis. Lasiagrostis.** III, 49.

1. Spikelets arranged in a spreading panicle, yellowish with a silvery sheen.—Rocky places in the mount. and subalp., here and there (wanting in Z. ? S.) 6 **Calamagrostis** Link. 2408.

629. *Polypogon*. Beardgrass. III, 28.

1. Spikelets arranged in a dense panicle, oblong-cylindric.—Waste places, near Freibg., probably introduced. 6 * *monspeliensis* Desv. 2409.

630. *Agrostis*. Bent-grass. III, 51.

1. Lower glume shorter than the upper. Awn 3—several times as long as the spikelet. *Apera*. 2
- Lower glume longer than the upper. Awn 0 or, at the most, twice as long as the spikelet 3
2. Panicle (large) spreading, ovoid. Anthers linear-oblong. Stem with 3—5 nodes. *A. purpurea* Gaud. (Spikelets less numerous, purplish.)—Among the corn; distrib. 6
Spica venti L. 2410.
- Panicle contracted, narrow, gen. interrupted. Anthers orbicular-oval. Stem with 2 nodes.—As the last; western Switz. 6 *interrupta* L. 2411.
3. Ls all flat. Upper glumella present. Awn gen. 0 4
- Ls, at least the rad., folded-bristly. Upper glumella 0 or very small. Awn gen. present. (Ligules oblong.) 5
4. Ligule (especially of the lower leaf) very short, truncate. Panicle (gen. violet) with an oblong-oval outline, and capillary branches; pedicels spreading in every way.—Grassy places, woods, water-side; everywhere. 6
vulgaris With. 2412.
- Ligule oblong (2—3 mm long). Panicle narrower in proportion than in the last, oblong-conic in contour, with rather stronger branches; pedicels spreading at an acute angle, only directed to the side and downwards, which makes the half-whorls appear more distant. Ls broader. *A. stolonifera* Koch.—As the last. 6 *alba* L. 2413.
5. Awn inserted towards the base of the lower glumella. (Branches of the panicle rough) 6
- Awn inserted about the middle of the lower glumella (rarely 0) 7
6. Panicle oval in contour. Stem 10—30 cm.—Rocky places of the Alp. 7 *alpina* Scop. 2414.
- Panicle lanceolate in contour. Stem 25—45 cm.—As the last; Alp. (V.) and Jura (Reculet and Faucille). 7
Schleichéri Jord. 2415.
7. Branches of the panicle rough. Stem 20—50 cm.—Varied: Awn gen. notched, exceeding the spikelet, or sometimes straight and shorter, or 0.—Damp places, swamps; distrib. but not common (wanting in G. U.). 7 *canina* L. 2416.
- Branches of the panicle smooth. Stem 10—20 cm. Spikelets smaller than in *A. alpina*.—Alp. 7 *rupestris* All. 2417

OBS. Hybrid: *A. canina-vulgaris* (Merc.).

631. *Calamagrostis*. Smallreed. III, 33, 49, 50.

1. Glumellas membranous, white-translucent. Axis of the spikelet not prolonged above the fl. Awns straight, rarely 0 **2**
- Glumellas of a firmer consistency, white-translucent only at the edges. Axis of the spikelet prolonged above the fl. in the form of a pedicel (rudiment of a second fl.). *Deyeuxia*. **6**
2. Hairs not numerous, about $\frac{1}{3}$ the length of the glumellas. Stem 40—60 cm. Pl. more delicate than the following species, with the habit of an *Agrostis*, whence it is named by Gaud.: *Agrostis pilosa*. Spikelets with or without awns.—Alp. and subalp. **7** *tenella* Host. 2418.
- Hairs numerous, as long as, or longer than, the glumellas. Stem 60—150 cm **3**
3. Glumes narrow-lanceolate, acuminate. (Panicle loose, the branches fairly distributed. Stem fairly smooth below the panicle) **4**
- Glumes linear-subulate, narrowed to a laterally compressed point **5**
4. Awn terminal, inserted in the cleft of the glumella, very short and scarcely exceeding the cleft. C. *Gaudiniana* Rehb.—Swamps, rather rare (wanting in G. S.). **7** *lanceolata* Roth. 2419.
- Awn inserted below the middle of the back, as long as, or rather shorter than, the glumella.—Alp. and subalp., not common. **7** *Halleriana* Dec. 2420.
5. Panicle loose, rather drooping, with equally distributed spikelets. Awn terminal.—Varied: Stem very rough below the panicle, or (b. *laxa* Host.) fairly smooth, the spikelets, at the same time, more finely and longer pedicelled.—River-shores; here and there (wanting in S.). **7** *litorea* Dec. 2421.
- Panicle stiff, erect, lobed on account of the clustered spikelets. Awn inserted at the middle of the back or lower.—Water-side, woods; distrib. **7** *Epigeios* Roth. 2422.
- 6 (1). Awn straight. Panicle narrow, stiff, brownish violet. C. *stricta* Nutt.—Peat-mosses; Pontarlier (French Jura) and Radolfzell (lake of Constance). **7** * *neglecta* Fr. 2423.
- Awn notched **7**
7. Hairs as long or almost as long as the glumellas. Awns gen. slightly exceeding (by 3 mm at most) the glumes, prominent or enclosed. C. *montana* Dec.—b. *acutiflora* Dec. Pl. taller, glumes narrower, hairs shorter.—Woods; distrib. **7** *varia* Link. 2424.
- Hairs only $\frac{1}{3}$ — $\frac{1}{4}$ the length of the glumellas. Awns gen. much longer than the glumes. C. *sylvatica* Dec.—

b. montana Host. Hairs longer; awn shorter.—Woods of the mount. and subalp., rarer than the last; T. V. B. O. Z. L. (wanting in the Jura). 7 **arundinacea** Roth. 2425.

632. *Gastridium*. *Nitgrass*. III, 33.

1. Spiciform panicle oblong-lanceolate, with a silken sheen. Spikelets with a long awn, more rarely (v. *muticum*) awnless.—Fields, after hay; Geneva. 5

lendigerum Gaud. 2426.

633. *Phragmites*. *Phragmites*. III, 53.

1. Stem up to 3 m in height. Spikelets gen. brownish violet, rarely (v. *flavescens*) brownish yellow.—Swampy meadows. water-sides; everywhere. 8 . . . **communis** L. 2427,

634. *Sesleria*. *Sesleria*. III, 36.

1. Lower glumella terminated by 2—4 setaceous teeth, and an awn springing from the midst of them. Ls flat.—Rocky wooded slopes; distrib. 3 . . . **coerulea** Ard. 2428.
- Lower glumella awnless or short-mucronate. Ls filiform. *Oreochloa disticha* Link.—Alp. (wanting in V. B. O.). 7 **disticha** Pers. 2429.
- Lower glumella indented at the tip, with a short awn or spine springing from the indentation. Ls obtuse, narrow-linear.—Alp., on granite; Tess.; rare. 7, 8 **sphærocephala** Ard, 2429.a

635. *Koeléria*. *Koeleria*. III, 41.

1. Lower glumella awned, the tip undiv. or shortly 2-fid. Stem tomentose above.—Alp.; G. T. W. U. 7 **hirsuta** Gaud. 2430.
- Lower glumella awnless, not or shortly mucronate 2
2. The dried l.-sheaths wearing finally into a thick network of fibres. Rad. ls rolled up, setaceous, glabr.—Hills; T. W.; Aigle, Neuchâtel. 6 **valesiaca** Gaud. 2431.
- The dried l.-sheaths not forming a fibrous net-work. Ls flat, the lower ones, as well as the l.-sheaths, hairy. —*b. gracilis* Pers. A narrow paniced form or species! Wall.—Pasturages, hills; distrib. 6 **cristata** Pers. 2432.

636. *Deschampsia*. *Deschampsia*. III, 59.

1. Awn distinctly jointed, sensibly longer than the glumella. Ls almost setaceous. Branches of the panicle 3-forked, wavy. Spikelets shining, of a violet brown. —Varied with the panicle more contracted (v. *montana* L.).—Wood-sides, especially in the mount. and Alp.; distrib. 6 . . . **flexuosa** Trin. 2433.

- Awn fairly straight, gen. shorter than the glumella or scarcely exceeding it (rarely 0) 2
- 2. Panicle pyramidal, the axis and branches more or less scabrous. Spikelets 3—5 mm long, variegated with brown, white and violet, or, in the shade (v. *altissima* Lam.), yellowish green, 2- (rarely 3-) fld.—Varied with larger and darker spikelets, and the awns rather longer: b. *litoralis* Gaud.—Damp, grassy places, woods; distrib. b. by the lake of Geneva and the Rhine below Schaffh. 6

cæspitosa Beauv. 2434.

- Panicle narrower and longer than in the last, often interrupted; axis and branches smooth. Spikelets much larger, 6—8 mm, less numerous, gen. variegated with yellow and light brown, composed of 3 and indeed 4 fls.—Sandbeds by the Rhine near Schaffh. 5, 6 **rhenana Grml. 2435.**

637. *Holcus*. *Holcus*. III, 57.

- 1. Awn curved like a hook, scarcely prominent. L.-sheaths covered with soft, spreading hairs.—Dry meadows; distrib. 6 **lanatus L. 2436.**
- Awn jointed, prominent. L.-sheaths gen. glabr.—Woods, fields; rarer than the last. 6 **mollis L. 2437.**

638. *Arrhenatherum*. *False-oat*. III, 57.

- 1. Panicle rather narrow. Spikelets (without the awn) 8—9 mm, gen. 2-fld, the lower male fl. with a long, almost rad., awn, the upper hermaphr. fl. with a short, almost terminal awn.—b. *tuberosum* Gilib. The 2—3 lower nodes of the stem swollen like tubercles.—Meadows, road-sides; distrib.; b. fields. 6, 7 **elatus M. K. 2438.**

639. *Avena*. *Oat*. III, 60.

- 1. Spikelets (at least after flowering) drooping. Glumes with 5—9 nerves. Ann. pls 2
- Spikelets erect. Glumes with 1—3 nerves. Perenn. pls 6
- 2. Fls jointed on the axis of the spikelets and falling off at maturity. Axis of the spikelet, as also the lower glumella, with reddish yellow hairs from the base to the middle, rarely (v. *ambigua* Schönh. *A. hybrida* Koch not Peterm.) glabr.—Corn-fields; not everywhere (wanting in U. L.). 7 **fátua L. 2439.**
- Fls not jointed on the axis and not falling off. Axis glabr. or only hairy at the base of the lower fl. 3
- 3. Spikelets gen. 3-fld. Lower glumella herbaceous-membranous, marked with strong nerves from the base to the tip.—Rare. 6 † **nuda L. 2440.**
- Spikelets gen. 2-fld. Lower glumella leathery, with distinctly prominent nerves only towards the top . 4

4. Lower glumella 2-fid, each of the points ending in a straight awn.—Rare; among the cultivated corn. 6
strigosa Schreb. 2441.
- Lower glumella shortly 2-fid and often denticulate, but the points not terminated by awns 5
5. Panicle spreading in every direction.—Cultivated and sometimes subsontaneous. 6 † **sativa L. 2442.**
- Panicle unilateral, with applied branches.—As the last. 6
† **orientalis Schreb. 2443.**
- 6 (1). Lower branches of the panicle 4—5 together. Spikelets 2—3-fid (15—20 mm long, without the awn), each with 3 dorsal awns fairly equal in length. Sheaths of the lower ls hairy, rarely glabr.—Meadows and pasturages; everywhere. 5 **pubescens Huds. 2444.**
- Lower branches of the panicle 1—2 together. Spikelets containing 4—5 fls. L.-sheaths glabrous 7
7. Ls very rough above. Panicle narrow, almost linear. Spikelets still larger than in the last, with a silvery sheen and slightly variegated with reddish brown.—Arid slopes, wood-sides; not very common (wanting in L.). 6
pratensis L. 2445.
- Ls fairly smooth above. Panicle ovoid-oblong. Spikelets variegated with brown, yellow and violet, rarely uniformly yellow. A. versicolor Vill.—Alp. 7
Scheuchzéri All. 2446.

640. **Trisetum. Trisetum.** III, 60, 38.

1. Panicle spiciform, contracted. Stem hairy at the top 2
- Panicle spreading, loose. Stem glabrous 3
2. Spikelets yellowish green. Hairs at the base of the fls almost as long as the fls themselves. Avena Cavanillesii Koch.—Sandy places; W. (Sierre, St. Leonard Montorge, between Fully and Saillon). 4 **Gaudinianum Boiss. 2447.**
- Spikelets variegated with violet, green and yellow. Hairs at the base of the fls much shorter than the fls themselves.—High Alp.; not common. 7
subspicatum Beauv. 2448.
3. Rt-stock short, tufted. Lower ls gen. hairy. Spikelets very numerous) greenish yellow.—Meadows; everywhere up to the Alp. where the spikelets are variegated with violet (v. variegatum). 6 **flavescens Beauv. 2449.**
- Rt-stock elongated, branchy. Ls glabr., distichous. Spikelets variegated. Type of *T. distichophyllum* 4
4. Hairs at the base of the ls half as long as the ls. Ls rather stiff—Stony places and slips of the Alp.; comp. the following! 7 **distichophyllum Beauv. 2450.**
- Hairs at the base of the ls at most $\frac{1}{3}$ the length of the ls. Ls soft.—As the last and hitherto confused with it,

by preference on the southern Alp. (Grimsel, Mt. Generoso). 7 **argenteum R. Sch.** 2451.

641. Aira. Aira. III, 60, 38.

1. Panicle contracted in the form of a spike. Stem 5—15 cm. —Uncultivated, sandy places; W. (St. Leonard: Thomas, Jaccard). 4 **præcox L.** 2452.
- Panicle spread out. Type of *A. caryophyllea* L. 2
2. Spikelets (almost 3 mm long) oblong, rather distant from one another. Stem 10—20 cm. Not unlike small specimens of 2433.—Uncultivated, sandy places; rare; T. V. J. (comp. the following). 5 **caryophyllea L.** 2453. *)
- Spikelets smaller and rather more swollen than in the last. Slightly crowded in clusters. Stems taller, gen. more numerous. *A. aggregata* Tim.—As the last and hitherto confused with it; V. ? 6, almost a month later. **multiculmis Dum.** 2454.

642. Danthónia. Danthonia. III, 61.

1. Lower glumella shortly 3-toothed at the top (or, more correctly, shortly 2-toothed with a very short awn like a third tooth). Stem prostrate-ascending. *Triodia* dec. Beauv.—Pasturages, especially in the mount. and subalp.; not common. 6 **decumbens Dec.** 2455.
- Lower glumella 2-fid at the top, with subulate points; awn longer, twisted at the base. Stem erect.—Tess. (casina di Meride up to the top of S. Giorgio). 5 **provincialis Dec.** 2456.

643. Mélica. Melic. III, 39, 64.

1. Lower glumella long ciliate-villous at the edges. (Panicle contracted to the form of a spike, cylindric.) Type of *M. ciliata*. See N. Beitr. III, 51 2
- Lower glumella glabr. 3
2. Panicle dense, uninterrupted. Glumes very unequal, the lower considerably shorter than the upper. *M. transylvanica* Schur.—Hills, rocky places; Hohentwiel, Alsace. 6 ***ciliata L.** 2457.
- Panicle looser, finally almost unilateral. Glumes not very unequal, the lower slightly shorter than the upper. Stem slenderer; ls rolled up, setaceous. *M. nebrodensis* auct.—As the last; fairly distrib. (wanting in L. S.). 6 **glauca F. Schultz.** 2458.
3. Spikelets erect, with a single fertile fl. Ligule opposite to the leaf, lanceolate-subulate.—Woods; distrib. 6 **uniflora Retz.** 2459.

*) *A. Cupaniana* Guss., according to Schmidely, near Coppet, probably adventitious.

- Spikelets drooping, with 2 fertile fls. Ligule in the 1-axil, scarcely visible.—Woods; everywhere. 6
nutans L. 2460.

644. *Briza*. Quake-grass. III, 65.

1. Panicle with capillary branches. Spikelets cordate-oval, beautifully variegated with violet, rarely pale yellow.—Dry meadows; everywhere. 5, 6 . . . *media* L. 2461.

645. *Eragrostis*. *Eragrostis*. III, 67.

1. Branches of the panicle very slender, the lower ones 4—5 together. Spikelets small, narrow (3—5 mm long).—Sandy places; G. T. W. V., Bâle, Zürich, Sarnen. 7
pilosa Beauv. 2462.
- Branches of the panicle stronger, the lower 1—2 together 2
2. Spikelets oblong-linear, large (8—12 mm long), rather dense. *E. megastachya* Link.—As the last; V., rare. 7
major Host. 2463.
- Spikelets lanceolate-linear, narrower and shorter than in the last, more distant from one another. *E. poeæoides* Beauv.—As the last; G. T. W. V. Bâle, Soloth., Aargau, Lucerne, Rapperswyl, Schaffh., partly, like the 2 last, introduced. 7 *minor* Host. 2464.

646. *Scleróchloa*. *Sclerochloa*. III, 41.

1. Panicle dense, spiciform; spikelets very shortly peduncled, awnless, variegated with green and white. *Poa dura* Scop.—Road-sides; Lower Wall. 5 *dura* Beauv. 2465.

647. *Poa*. *Poa*. III, 71.

1. Stem thickened at the base like a bulb, or more or less swollen by the sheaths which surround it. (Branches of the panicle gen. 1—2 together) 2
- Stem not thickened at the base 4
2. Ligule of the lower leaf short, truncate, that of the upper l. oblong, acute. Spikelets often changed to leafy buds (*v. vivipara*). Ls fairly broad, linear.—Alp., subalp. and Jura. 6, 7 *alpina* L. 2466.
- Ligules of all the ls oblong, acute 3
3. Spikelets containing 4—6 fls, slightly swollen, gen. changed to leafy buds. Ls narrow linear. Panicle less spreading than in the last during the flowering period. Fls united at the base by abundant cottony hairs.—Pasturages, road-sides; fairly distrib. but not everywhere. 5 *bulbosa* L. 2467.
- Spikelets containing 6—10 fls, compressed, the fls very crowded (recalling those of *Eragrostis*!), never vivi-

parous. Pl. forming a dense tuft; ls rolled up; panicle dense.—Dry slopes; W. (Branson, Sion &c.). 4

concinna Gaud. 2468.

- 4 (1). Stem and l.-sheaths compressed-ancipitate 5
- Stems and sheaths, at all events the stems, cylindric, rarely the stems slightly compressed 8
5. Rt-stock with elongated stolons. L.-sheaths almost smooth. Lower branches of the panicle gen. 2—3 together (in b. *Langeana* Richb. 4—5). Stems 20—40 cm, arched-ascending.—Fields, walls; distrib. 6 **compressa L.** 2569.
- Rt-stock without or with short stolons. L.-sheaths rough. Lower branches of the panicle gen. 4—5 together 6
6. Ligules oblong, acute. Stem 40—50 cm 13
- Ligules short, obtuse. Stem 70—100 cm 7
7. Ls linear-lanceolate, broad (5—10 mm), suddenly acuminate at the top and cap-shaped. P. Chaixi Vill.—Alp., subalp. and Jura. 6 **sudetica Hänk.** 2470.
- Ls longer than in the last, narrowed insensibly, very acute.—As the last; western Switz., especially in the Jura. 6 **hybrida Gaud.** 2471.
- 8 (4). Rt-stock with elongated stolons 9
- Rt-stock without or with short stolons 10
9. Lower branches of the panicle gen. 4—5 together. Ligules short, truncate.—Varied: rad. ls (b. *angustifolia* L.), rarely all (c. *strigosa* Hoffm.) folded-setaceous, or ls shorter, broader and glaucous (d. *humilis* Ehrh.); the stem rarely compressed-ancipitate (e. *anceps* Gaud.).—Meadows, pasturages, walls; everywhere 5
- Lower branches of the panicle gen. 2—3 together. Ligules of the upper ls oval. Ls of the stolons distichous. P. *cenisia* Koch., P. *flexuosa* Wahlb.—b. *Halleridis* R. Sch. Spikelets greenish (not coloured); glumes broader, oval-lanceolate (Rap.).—Stony places of the Alp.; Hasenmatt in the Jura. 7 **distichophylla Gaud.** 2473.
- 10 (8). Branches of the panicle almost or entirely smooth, the lower ones 1—2 together. (Ligules oblong) 11
- Branches of the panicle rough, the lower 4—5 together, in poor specimens also 3—2 13
11. Branches of the panicle spreading horizontally, finally bent downwards. Ann. pl. or, in high lying districts, where the spikelets are coloured dirty violet, the prostrate and rooting stem (b. *supina* Schrad.) living through the winter.—Grassy places, road-sides; everywhere. 4—10
- Branches of the panicle erect-spreading. Perenn. pls **annua L.** 2474.
12. Panicle with almost capillary branches (which tremble when the pl. is held in the hand). Spikelets containing

- 4—5 fls; glumes shorter than the spikelet. The upper l. shorter than its sheath.—High Alp. 7 **minor Gaud.** 2475.
- Panicle with filiform branches (but firmer). Spikelets containing 2—3 fls (sometimes yellowish); glumes as long as the spikelet. The upper l. as long as, or longer than, its sheath.—High Alp. 7 . . . **laxa Hänk.** 2476.
- 13 (10). Ligules oblong, gen. acute **14**
- Ligules short, truncate, or the upper oval **15**
14. L.-sheaths rough, rarely smooth, the upper one longer than its leaf. Glumellas distinctly nerved, not spotted. Stem rough towards the top.—b. *rubescens Reut.* (Lake of Geneva).—Damp places, ditches; everywhere. 6
- trivialis L.** 2477.
- L.-sheaths smooth, rarely rather rough, the upper as long as, or gen. shorter than, its l. Glumellas faintly nerved, with a spot of yellowish brown. Stem smooth towards the top. P. *fertilis* Host., P. *palustris* Roth.—Damp meadows; here and there (wanting in G. T. W.). 6
- serotina Ehrh.** 2478.
15. L.-sheaths shorter than the internodes, the upper one shorter than its l., the nodes, in consequence, not covered.—Very variable; gen. not very firm, the caul. ls spreading horizontally, and the spikelets containing 2—1 fls. The form exposed to the sun (b. *firmula Gaud.*) stiffer, the spikelets containing 3—5 fls; the mountain form (c. *montana Gaud.*): spikelets less numerous, but larger and supported by longer, slenderer pedicels; rarely (d. *glauca Gaud.*) the ls glaucous.—Woods, walls, rocks; everywhere. 6 **nemoralis L.** 2479.
- L.-sheaths longer than the internodes, consequently covering the nodes, the upper one longer than its leaf Pl. of a sea-green.—Rocky places in the Alp. and sub-alp.; rare; Creux du Van; Morcles? Gemmi? Bagnethal at Lancet: Vetter; Tzermontanaz: Schneider; Piz Paddella, 7 **cæsia Sm.** 2480.

648. *Glycéria*. *Glyceria*. III, 71.

1. Lower glumella 5-nerved. Lower branches of the panicle reflexed after flowering.—Damp places; W. V. (Sion, Viège; Chatelaine near Geneva). 5, 6
- distans Wahlb.** 2481.
- Lower glumella 7-nerved **2**
2. Stem erect, tube-like, 10—20 dm. Ls linear-lanceolate (10—20 mm broad). Panicle spreading equally in all directions, the branches numerous. G. *spectabilis* M. K. —Ditches and water-sides in the Swiss plateau (wanting in G. T. W. U.). 6 **aquatica Wahlb.** 2482.

- Stem more or less prostrate at the base, 4–9 dm. Ls linear. Panicle more or less distinctly unilateral. Type of *G. fluitans* 3
- 3. Panicle distinctly unilateral; branches spreading horizontally during the flowering period, the lower ones gen. 2 together. Spikelets (with silvery white edges to the glumes) 20–30 mm; glumellas oblong-lanceolate, subacute, distant. Anthers pale violet.—Ditches; distrib. 5
fluitans R. Br. 2483.
- Panicle spreading in almost every direction, broader than in the last, the joints closer together; branches spreading, the lower ones 3–5 together. Spikelets more numerous and shorter (about 15 mm). Glumellas oval-oblong, rather obtuse, crowded. Anthers yellow.—As the last *plicata* Fr. 2484.

649. *Catabrôsa*. *Catabrose*. III, 69.

1. Panicle spreading uniformly. Spikelets small (3 mm), tinted with violet. *Glyceria airoides* Rehb.—Marsh-ditches; inundated places; here and there. 6 *aquatica* Beauv. 2485.

650. *Molinia*. *Molinia*. III, 63, 66.

1. Stem with only 1–2 nodes (close together) quite at the base, with neither nodes nor ls above. Spikelets not awned, gen. dark violet, rarely yellow, in a large wood form (v. *arundinacea* Schrank.) mostly greenish.—Marshy meadows, damp woods; distrib. 6
coerulea Mönch. 2486.
- Stem leafy up to the panicle. Spikelets shortly awned. *Diplachne serotina* Link.—Slopes; T. W. V. 8
serotina M. K. 2487.

651. *Dactylis*. *Cock's-foot*. III, 54.

1. Panicle lobed, unilateral, with clustered spikelets; the branches bare for some distance at the base, less often (v. *hispanica* Roth.) the panicle is entirely contracted, spiciform.—Meadows, road-sides; everywhere. 6
glomerata L. 2488.

652. *Cynosurus*. *Dog's-tail*. III, 34.

1. Spiciform panicle linear. Spikelets awnless.—Meadows, pasturages; distrib. 6 *cristatus* L. 2489.
- Spiciform panicle oval. Spikelets long-awned.—Fields; T. W., also sometimes here and there adventitious. 5
echinatus L. 2490.

653. *Sclerôpoa*. *Scleropoa*. III, 68.

1. Panicle dense, stiff, the spikelets supported by short, thick, 3-cornered pedicels. *Festuca rigida* Kunth.—Sandy places, road-sides; T. W. V. 5 . . . *rigida* Griseb. 2491.

654. *Vulpia*. *Vulpia*. I, 5. III, 40.

1. Lower glumella long-ciliate. *Festuca myurus* Koch.—Sandy places; Geneva, very rare. 6 *ciliata* Link. 2492.
- Lower glumella not ciliate 2
2. Stem 30—40 *cm*, leafy up to the panicle. Panicle elongated, drooping at the top. Upper glume distinctly shorter than the glumella of the fl. immediately above it. *Festuca myurus* L. ex Duval-Jouve.—Dry, sandy and grassy places; Z., southern and western Switz.; and sometimes adventitious in other parts. 5 *pseudomyrus* Soy.-Will. 2493.
- Stem 20—30 *cm*, leafless below the panicle. Panicle shorter, erect. Upper glume almost reaching the awn of the next glumella. *Festuca bromoides* Sm. Koch not L.—As the last; Geneva, Bâle, Rheinfelden. 5 *sciuroides* Rchb. 2494.

655. *Festuca*. *Fescue*. III, 63, 70. *)

1. Shoots much thickened at the base (almost like a bulb). Spikelets brownish yellow.—Alp.; Tess. 6 *spadicea* L. 2495.
- Shoots not thickened at the base 2
2. Ls (also when fresh) all, or at least the rad. ones, folded-setaceous or folded-filiform 3
- Ls, at least when fresh, all flat (comp. *F. pulchella*) 13
3. Ligule very short, bi-auricled, *i. e.* prolonged on each side to a small lobule 4
- Ligule truncate or elongated and oblong, but not bi-auricled. (A high Alpine pl.: Spikelets gen. variegated with violet, more rarely yellowish) 11
4. Ls all folded-setaceous. Shoots (barren l.-clusters) intravaginal (*i. e.* found during growth between the axil and sheath): rt-stock consequently forming a dense tuft 5
- Caul. ls flat, or at any rate channelled-open (but sometimes very narrowly). Shoots partly, at any rate, extravaginal (*i. e.* springing obliquely and piercing the sheath). Type of *F. rubra* 9
- Comp. *F. rubra trichophylla* (with filiform ls, but stoloniferous), *F. rubra fallax* (densely cæspitose, but caul. ls flat), and *F. violacea genuina* (densely cæspitose and ls almost filiform).
5. The closed lower half of the sheath with a deep, narrow furrow. Ovary hairy at the top. Stem 50—80 *cm*. Ls filiform, long. Panicle lax, often tinted with amethyst blue. Spikelets unarmed, rarely with very short awns.

*) Comp. N. Beitr. III, 36.

F. ovina vaginata Koch.—Dry hilly places, pine-woods; Bex, Aigle, Tombey (Jaccard), above Lausanne (Favrat), Geneva, Axenstrasse, Uto, Albis, Hörnli. 7

amethystina L. 2496.

— The closed part of the sheath not furrowed. Ovary glabr. Type of *F. ovina* 6

6. Anthers 1 mm long at most. Stems 8–12 cm, entirely smooth as also the soft filiform ls. Panicle short, racemose. Spikelets rather small, green, containing 2–3 fls. Lower glumella subulate-lanceolate. Awn half as long as the glumella.—High Alp. 7 *alpina* Sut. 2497.

— Anthers longer (1½–3 mm) 7

7. Sheaths of the shoots closed to the top or at any rate to above the middle. Sheaths entirely smooth, as also the green, filiform ls. Panicle gen. in the form of a rather dense raceme. Spikelets variegated with violet. Awn often as long as the glumella.—Alp., especially on the southern chain. 7 *Halleri* All. 2498.*)

— Sheaths only closed at the base (rarely in the lower third part), cleft throughout the remainder of their length 8

8. Ls cylindric, when dry convex at the sides, smooth or rather rough. Ring of the sclerenchyma closed.—a. *capillata* Lam. Ls almost capillary; spikelets small, unarmed.—b. *vulgaris* Koch. The same characters but awns ¼–⅓ the length of the glumella.—c. *duriuscula* L. Stem stouter; spikelets larger; ls more thickened, green or rather glaucous, sometimes (v. *curvula*) curved or (v. *crassifolia*) thicker, rush-like.—d. *glaucæ* Lam. As the var. c., but ls and sheaths more or less pruinose. With this form is connected as v. *major*: *F. vaginata* Gaud. not W. K.—Pasturages, hills, rocks: d. less common. 5 *ovina* L. 2499.

— Ls compressed laterally and, when dry, furrowed, gen. very rough. Ring of the sclerenchyma interrupted.—a. *typica*. Ls capillary, pruinose; spikelets small (smaller than in *F. glaucæ*); lower glumella lanceo-late-subulate.—b. *sulcata* Hack. (*duriuscula* Host. not L.). Ls slightly thicker, not pruinose; spikelets rather larger; glumellas broader.—Dry, sunny places; W.; b. Pontresina in the Engadine. 5 *valesiaca* Schl. 2500.

9 (4). Shoots more or less prolonged in subterranean stolons. Ovary glabr. at the top.—a. *genuina*. Pl. more or less creeping, forming a loose tuft; ls of the shoots

*) *F. rupicaprina* Hack., differing in its ls only having 5 vascular bundles (instead of 7), its spikelets pruinose, and its awns shorter, on the cañe Alps (Pilatus, Frohnalpstock).—*F. dura* Host. on the eastern frontiers near Bormio.

- folded, caul. ls flat. Also varied with larger spikelets (v. *megastachya*), with glaucous ls (v. *glaucescens*), with thicker, almost rush-like, ls (v. *juncea*), with the spikelets short-pubescent (v. *barbata*).—b. *planifolia* *Trautv.* Like a. but all the ls flat, 2—3 mm broad.—c. *trichophylla* *Ducr.* Ls all folded-filiform, scarcely $\frac{1}{2}$ mm broad.—d. *fallax* *Thuill.* Pl. forming a dense tuft, in other respects like a.—Pasturages, road- and wood-sides; distrib.; d. principally (like v. *alpestris* = *F. nigrescens* *Lam.* not *Gaud.*) on the Alp. and Jura. 5 ***rubra* L. 2501.**
- Shoots short erect, or suddenly curved-ascending; pls consequently more or less cæspitose. Ovary hairy at the top, rarely glabrous **10**
10. Most of the shoots intravaginal. Spikelets linear-oblong, gen. greenish. Stem 60—120 cm. Ls limp, very long, those of the shoots filiform, the caul. broader (2—3 mm), flat. Panicle loose, often slightly drooping.—Wood-sides and -clearings; rather rare. 6 ***heterophylla* Lam. 2502.**
- Shoots all, or mostly, extravaginal. Spikelets elliptic or elliptic-lanceolate, gen. tinted with violet.—a. *genuina* (*F. violacea* *Gaud.*). Ls of the shoots soft, smooth, capillary; the caul. very little broader ($\frac{1}{2}$ mm). Stem angular above, 15—28 cm. Panicle with few spikelets. Spikelets unarmed or short-awned, rarely (v. *aurata* *Gaud.*) yellowish.—b. *nigricans* *Schl.* (*nigrescens* *Gaud.* not *Lam.*) Ls rough, at any rate towards the end, the caul. broader (2 mm when spread out), almost flat. Stem taller, 30—40 cm, subcylindric above, smooth. Panicle with many spikelets, the spikelets larger, awns $\frac{1}{2}$, or more, as long as the glumella.—Alp.; b. Alp., subalp. and Jura. 7 ***violacea* Gaud. 2503.**
- 11 (3). Lower branches of the panicle gen. 5 together. Ovary glabr. *Poa violacea* *Bell.*—Alp.; G. T. W. U. 7 ***pilosa* Hall. f. 2504.**
- Lower branches of the panicle 1—2 together. Ovary hairy at the top. Type of *F. varia* **12**
12. Ls capillary. Stems 15—20 cm. Spikelets containing 3 to 5 fls. Lower glumella distinctly acuminate.—Varied with yellowish spikelets (v. *lutea*).—Alp. and southern Jura. 7 ***pumila* Chaix. 2505.**
- Ls thicker. Stems 15—40 cm. Spikelets 4—7-fl. Lower glumella not, or indistinctly, acuminate. Spikelets variegated (v. *versicolor*) or yellowish (v. *acuminata* = *F. flavescens* *Gaud.* not *Bell.**)—Alp., especially the southern chain. 7 ***varia* Hænke. 2506.**

*) The true *F. flavescens* *Bell.* is found in the valley of Cogne, which opens into that of Aosta.

- 13 (2). Lower glumella long-awned; the awn gen. twice as long as the glumella, whitish, wavy. Panicle loose and drooping.—Shady, damp places, woods; distrib. 6
***gigantea* Vill. 2507.**
- Lower glumella without, or with a short, awn, distinctly shorter than the glumella **14**
14. Spikelets broad, obovate-rhomboidal. Ls 2—4 *mm* broad, sometimes (v. *jurana*) more or less folded. Branches of the panicle capillary, wavy, entirely smooth. *F. Scheuchzeri* Gaud.—Alp. and southern Jura. 7
***pulchella* Schrad. 2508.**
- Spikelets elliptic-lanceolate or oblong-lanceolate **15**
15. Ligule oblong. Ovary hairy at the top. Stem 100—120 *cm*. Spikelets rather small.—Woods in the mount., here and there (wanting in T. S.). 6 . . . ***sylvatica* Vill. 2509.**
- Ligule very short, truncate. Ovary glabrous . . . **16**
16. L.-sheaths cleft. Ls rolled up during æstivation. Type of *F. elatior* **17**
- L.-sheaths not cleft. Ls folded during æstivation. Comp. *F. rubra* 9.
17. The shortest of the 2 lower branches of the panicle bearing 1—2 spikelets, the longest 3—5 spikelets, rarely (v. *pseudololiacea*) the panicle almost in the form of a raceme. Stem 4—8 *dm*.—Meadows; everywhere. 6
***pratensis* Huds. 2510.**
- The shortest of the lower branches of the panicle bearing 3—10 spikelets. Stem 8—15 *dm*, almost reed-like. Ls broader, strongly nerved above. Panicle large, drooping. *F. decolorans* M. K. (local form).—b. *aristata* Grm. N. Beitr. II, 12 (Uechtriziana Wiesb ?). Panicle denser, less drooping; spikelets rather larger; awn $\frac{1}{2}$ — $\frac{2}{3}$ the length of the glumella; stem rough below the panicle.—Damp meadows, water-side; distrib. b. Kreuzlingen. 6
***arundinacea* Schreb. 2511.**

OBS. Hybrids: *F. pratensis-Lolium perenne* (*F. loliacea* Curt.) and *F. pratensis-Lolium italicum*.

656. *Bromus*. Brome. III, 62.

1. Lower glume 1-nerved, upper 3-nerved. *Bromus* . . . 2
- Lower glume 3—5-nerved, upper 5—many-nerved. *Serrafalcus* **6**
2. Spikelets, also after flowering, narrowed towards the top. Awn 0, or shorter than the glumella. Perenn. pls **3**
- Spikelets enlarged towards the top. Awn as long as, or longer than, the glumella. Ann. or bienn. pls . . . **5**
3. Panicle limp, drooping. (Stem 80—120 *cm*. Ls 8—12 *mm*) **3b**
- Panicle erect or slightly drooping **4**

- 3b. Lower branches of the panicle 3—6 together, 1 or 2 of them short, only bearing 2—1 spikelets; sheaths of the upper ls shortly hairy or almost glabr.—Woods; localities to be verified on account of the confusion with the following; see N. Beitr. III, 25 **asper** Murr. 2512.
- Lower branches of the panicle 2 together, very divergent, bearing several or many spikelets; sheaths of the ls covered with long hairs; panicle larger and looser; stem often taller; ls broader; flowering period rather later. *B. serotinus* Benek. 1845.—As the last; above Chillon in company with the last! and probably in many other places . **ramosus** Huds. (1762). 2512.b*)
4. Ls folded during æstivation, the rad. narrower than the caul., long-ciliate. Lower glumella with a short awn.—Pasturages, road-sides; everywhere. 6 **erectus** Huds. 2513.
- Ls rolled up during æstivation, fairly equal in width, glabr. Lower glumella unarmed or short-mucronate.—Plains, very rare; near Bâle, Rheinfelden, Schleithem; Orbe? (a single specimen in 1885!). 6 **inermis** Leyss. 2514.
- 5 (2). Panicle very loose, the branches drooping on almost every side; branches very rough; spikelets with awns 50—60 mm, gen. not hairy. Stem 30—60 cm.—Walls, road-sides; everywhere. 5 . . . **sterilis** L. 2515.
- Panicle fairly dense, drooping on one side, the branches smooth. Spikelets shorter, soft pubescent. Stem 20—30 cm. b. *floridus* Grml. (glabratus Sond.?) Stem taller; spikelets more numerous, glabr.—As the last, but not everywhere (wanting in B. L.); sometimes adventitious; b. Wall., Wilchingen, Diessenhofen. 5 **tectorum** L. 2516.
- 6 (1). Sheaths of the ls furrowed, glabr., rarely with scattered hairs. Fl., when mature, contracted at the edges, cylindric and distant. Type of *B. secalinus* . . . 7
- Sheaths of the ls, at any rate the lower ones, hairy. Fls, also at maturity, imbricate, covering one another, at any rate by the base 8
7. Spikelets 15—20 mm, glabr. (not hairy) or rough. Awns slender, undulated-flexible.—Among corn; distrib. 6 **secalinus** L. 2517.
- Spikelets larger, 20—30 mm, gen. velvety-hairy, rarely glabr. Awns stronger and longer than in the last, straight. *B. grossus* Gaud.—As the last, gen. less common. 6 **velutinus** Schrad. 2518.
8. Lower glumella exactly as long as the upper. Panicle with elongated branches, drooping on almost every side. Spikelets narrow, lanceolate, gen. tinted with violet or brown.—Waste places, fields; scattered (wanting in U.) 6 **arvensis** L. 2519.

*) According to Oborny Fl. Mähr.

- Lower glumella distinctly longer than the upper 9
- 9. Awn inserted below the top which is deeply 2-fid, finally or, when dry, often spreading-divergent. (Panicle drooping) 10
- Awn inserted higher, below the top which is shortly 2-fid, erect or slightly curved outwards 11
- 10. Panicle (in a normal pl.) compound. Spikelets lanceolate, 20 mm. Fls gen. separated at maturity, only covering each other quite at the base. Distinguishable from *B. arvensis* by its panicle drooping more decidedly on one side, its spikelets more compressed, and its anthers shorter.—Fields, rare and perhaps only introduced; Aargau (Bremgarten!), Neuchâtel, Aubonne. 5, 6 (earlier than 2519) patulus M. K. 2520.
- Panicle gen. racemose (branches bearing 1 spikelet). Spikelets oblong-lanceolate, 25—40 mm. Fls covering each other to a considerable extent when mature, glabr. or (v. villosus) hairy.—Arid, sandy places; T. W. V.; sometimes also adventitious in other places. 5 suarrosus L. 2521.
- 11. Panicle erect after flowering, contracted. Spikelets oval-oblong, gen. soft-pubescent. Fls dense; lower glumella strongly nerved. Stem covered above with numerous spreading hairs.—Uncultivated places, road-sides; everywhere. 5 mollis L. 2522.
- Panicle more or less drooping after flowering, sometimes also almost erect in 2523. Spikelets gen. glabr.; fls rather less dense; lower glumella faintly nerved. Stem glabr. above. Type of *B. racemosus* 12
- 12. Spikelets (15—20 mm) oblong-oval, composed of 5—6 fls. Lower glumella almost regularly rounded at the edges. —Fields, grassy places, road-sides; localities still to be verified on account of the general confusion with the following. 5, 6 racemosus L. 2523.
- Spikelets (20—30 mm) oblong-lanceolate, containing 6 to 8 fls, more acute than in the last. Lower glumella enlarged above the middle of the edge in an obtuse angle (as in 2522). Panicle rather looser, and with finer branches than in the last.—As the last (common, at any rate, in Canton Vaud). 5, 6 commutatus Schrad. 2524.

657. *Brachypodium*. False Brome. III, 21.

- 1. Awns of all the fls shorter than their glumella. Ls rather stiff. Rt-stock creeping. Spikelets hairy or (v. rupestre) glabr.—Thickety hills, wood-edges; distrib. 6 pinnatum R. Br. 2525.

- Awns of the upper fls (of one spikelet) longer than their glumella. Ls limp. Rt-stock short, loosely tufted. Ls broader.—Woods; distrib. 7, later than the last
sylvaticum R. Sch. 2526.

658. *Nardurus*. *Nardurus*. III, 21.

- 1. Spike unilateral. Fls linear-lanceolate, very acute, short-mucronate or (v. *aristatus*) long-awned. *N. tenellus* Rchb., *F. tenuiflora* Schrad.—Arid, sandy places; Geneva, very rare. 5 **unilateralis Boiss. 2527.**
- Spike distichous. Fls oblong-lanceolate, subobtusely, unarmed or (v. *aristatus*) awned. *N. Poa* Boiss., *Festuca Lachenalii* Spenn.—As the last; Tess. (Locarno, Taverne), Aarg. (Schöftland, probably adventitious). 5
Lachenalii Godr. 2528.

659. *Gaudinia*. *Gaudinia*. III, 15.

- 1. Like an *Avena* with the inflorescence of a *Lolium*! Ls hairy.—Uncultivated places, road-sides; W. V. 6
fragilis Beauv. 2529.

660. *Agropyrum*. *Agropyrum*. III, 20.

- 1. Rt-stock not creeping. Awns longer than the glumellas. Type of *A. caninum* 2
- Rt-stock long-creeping. Awns 0 or shorter, rarely as long as, or longer than, the glumellas. Type of *A. repens* 3
- 2. Spikelets gen. composed of 5 fls. Ls fairly broad.—Shady places, hedges; distrib., but not common. 6
caninum R. Sch. 2530
- Spikelets composed of 2—3 fls. Ls narrower than in the last. — G. W. (Finstermünz, Viège). 6 **biflorum Rchb. 2531.**
- 3. Glumes acute or acuminate. Lower glumella faintly nerved. Quick-grass.—Hedges, road-sides, fields, gardens; distrib. 6 **repens Beauv. 2532.**
- Glumes very obtuse or truncate. Lower glumella more strongly nerved. —? b. *intermedium* Host. (campestre Gr. Godr. not Kit.). Ls flatter; glumes more acute (lake of Geneva).—Hills, road-sides; W. V. 6
glaucum R. Sch. 2533.

661. *Triticum*. *Wheat*. III, 20.

- 1. Axis of the spike, of an even breadth, tough, not jointed. Fr. not adherent to the glumellas 2
- Axis of the spike composed of pear-shaped joints which fall off with the spikelets when ripe. Fr. adherent to the glumellas (the seeds also do not fall out in threshing, but only the spikelets are obtained!) 5

662. **Secále. Rye. III, 19.**

663. **Elymus.** Lyme-grass. III, 14.

664. **Hórdeum. Barley.** III, 14.

- | | | |
|----|--|---|
| 1. | All the spikelets sessile, hermaphrodite and awned. Cultivated species | 2 |
| — | The middle spikelet hermaphr. and awned, the 2 lateral ones male and not awned. Cultivated species | 3 |
| — | The middle spikelet hermaphr., the 2 lateral ones male, all 3 awned. Wild species | 4 |

2. Spike 4-cornered (2 more prominent rows on each side).—6 † *vulgare* L. 2543.
- Spike 6-cornered (spikelets in 6 equally prominent rows).
—6 † *hexástichum* L. 2544.
3. Awns fairly parallel.—6 † *distichum* L. 2545.
- Awns finally diverging like a fan.—6 † *Zeocriton* L. 2546.
- 4 (1). Glumes of the middle spikelet linear-lanceolate, ciliate on both edges.—b. *leporinum* Link. (*H. pseudomurinum* Tapp. Koch). Inner glume of the lateral spikelets rather broader and ciliate on both edges. (In the typical form it is linear-setaceous, and ciliate on one side towards the base.)—Road-sides, walls; everywhere. b. Lower Engadine, W. (Sion, Martigny, St. Maurice), Geneva. 5
murinum L. 2547.
- Glumes of all the spikelets setaceous and rough (not ciliate). Spike narrower than in the last; stem taller (5—8 *dm.*).—Meadows; Geneva, Vaud, Neuchâtel. 6
secalinum Schreb. 2548.

665. *Lolium*. *Lolium*. III, 17.

1. Fls lanceolate; lower glumella herbaceous-scarious 2
- Fls (when mature) elliptic; lower glumella almost cartilaginous. (Ann. pls) 5
2. Perenn. pls, with clusters of ls bearing no fls . 3
- Ann. pls, without the l.-clusters 4
3. Fls not awned. Stem fairly stiff, smooth. Ls dark green, folded during æstivation.—b. *tenuë* L. Stem slenderer; ls narrower; spikelets more distant, composed of only 3—4 fls (instead of 6—12).—Road-sides, grassy places; everywhere. 6 *perenne* L. 2549.
- Fls long-awned, more rarely some of them not awned. Stem taller than in the last, more hollow, rough above. Ls bright-green, shining, rolled up during æstivation.—Grassy places, road-sides; naturalised; also cultivated. 6
italicum A. Br. 2550.
4. Stem 50—90 *cm*, flexible. Spikelets numerous, composed of 10—25 fls, spreading during the anthesis, the upper awned, more rarely all awnless. Variety of the last? L. Gaudini Parl.—Fields, gravelly places; V. 5
multiflorum Gaud. 2551.
- Stem 15—25 *cm*, fairly stiff, branched at the base. Spikelets not numerous, composed of 5—7 fls, applied against the axis, not awned.—Hills; W. (Montorge near Sion). 5
rigidum Gaud. 2552.
- 5 (1). Glumes distinctly shorter than the spikelet. Fls gen. not awned, 4 *mm* long. Stem slender, 30—50 *cm*. L. *remotum* Schrank, L. *arvense* Schrad. not With.—Fields,

almost exclusively among flax, but not everywhere. 6

linicolum A. Br. 2553.

- Glumes gen. longer than the spikelet. Fls gen. awned, 6—10 mm long. Stem stouter, 50—100 cm. Type of *L. temulentum* 6

- 6. Awns straight, strong, longer than the glumella.—Among corn; distrib. 6 *temulentum* L. 2554.

- Awns wavy, feebler, and shorter than the glumella. Stem gen. paler. *L. album* Huds.?—Varied: Stem and sheaths smooth (*L. arvense* With.) or rough (*L. robustum* Rchb.).—As the last, and confused with it. 6

speciosum Bieb. 2555.

OBS. Hybrid: *L. italicum-perenne*.

666. *Nardus*. Mat-grass. III, 16.

- 1. Spikelets arranged in a narrow, unilateral spike. Spikelets subulate, awned. Pl. forming a dense tuft.—Pasturages and peat-moors, especially of the mount. and subalp.; distrib. 5 *stricta* L. 2556.

OBS. Among the cultivated pls of this family (may be mentioned *Zea Mays* L. and *Sorghum vulgare* Pers.

122. Coniferæ.

667. *Ephedra*. *Ephedra*. XXII, 3.

- 1. Small leafless shrubs, diœcious, with opp. branches. Resembling some species of Equisetaceæ. Male catkins sessile; fem. catkins peduncled, transformed at maturity into false red berries.—Rocky places; W. (Sion, Saillon, Fully). 4, 5 *helvetica* C. A. Mey. 2557.

668. *Taxus*. Yew. XXII, 5.

- 1. Ls distichous (as in *Abies pectinata*), acute, yellowish green underneath.—Woods; fairly distrib. 4

baccata L. 2558.

669. *Juniperus*. Juniper. XXII, 5. XXI, 4.

- 1. Ls of 2 forms: some scale-like, small, rhomboidal, imbricate in 4 rows; the others more acicular, lanceolate-subulate, spreading and more or less distant. False berries supported by a curved peduncle which is shorter than the berries themselves. (The *J. virginiana* L. is very similar and often cultivated in shrubberies, its false berries are supported by an erect peduncle which is as long as the berries).—Alp. and subalp. 4, 5

Sabina L. 2559.

- Ls acicular, linear-subulate or lanceolate-subulate, spreading, in whorls of 3 2
- 2. Ls linear-subulate, narrowed insensibly to a piercing point, spreading, straight. False berries $\frac{1}{2}$ — $\frac{1}{3}$ the length of the ls. Common juniper.—Arid slopes, wood-edges; distrib. 4 **communis** L. 2560.
- Ls lanceolate-subulate, broader, shorter and more suddenly contracted to a point which is less piercing, spreading-curved inwards, or almost applied-imbricated. False berries almost as long as the ls. Lower shrubs prostrate and ascending.—Alp. and high Alp.; Reculet and Dôle in the Jura. 7 **nana** Willd. 2561.

670. *Cupressus*. *Cypress*. XXI, 4a.

1. Branches and twigs erect (as in the poplar of avenues); twigs 4-cornered. Ls scale-like, small, obtuse, imbricated in 4 rows. Cones 30—40 mm long.—Cultivated in shrubberies in warm parts. 4 † **sempervirens** L. 2562.

671. *Thuia*. *Thuia*. XXI, 4a.

1. Branches ramified in a horizontal plane. Ls on the surface of this plane with a glandular callosity below the tip. Cones small, 10—15 mm long, light brown.—In shrubberies, hedges and cemeteries. 4 † **occidentalis** L. 2563.
- Branches ramified in a vertical plane. Ls with a longitudinal furrow on the back. Cones larger than in the last, covered with a bluish bloom.—Less commonly cultivated than the last. 4 † **orientalis** L. 2564.

672. *Pinus*.*) *Pine*. XXI, 5.

1. Ls 5 together in a sheath. Seeds not winged, almost the size of a hazel-nut, edible. (Siberian Stone-Pine).—Alp. up to 2200 m, especially in G. and W., very scattered elsewhere. 6 **Cembra** L. 2565.
- Ls 2 together in a sheath. Seeds winged, small 2
2. Cones distinctly peduncled, the peduncle reflexed immediately after flowering. Boss of the scales flat. Ls glaucous inside (4—6 cm long). Heart-wood reddish. Scotch Fir.—Woods, up to 1500 m. 5 **sylvestris** L. 2566.
- Cones sessile or very shortly peduncled, spreading obliquely and horizontally at a later stage 3
3. Ls glaucous, 10—15 cm. Buds of the twigs acuminate with a beak. Boss of the scales pale yellow, faintly convex, the umbilicus shining and with no blackish ring. Heart-wood blackish gray. *P. nigricans* Host.—

*) According to Christ.

Cultivated in shrubberies, more rarely solitary in forests; 5, rather later than the last. . . † **Laricio Poir.** 2567.

- Ls bright-green, rarely exceeding 5 cm. Buds of the twigs obtuse or short-acuminate. Boss of the scales grayish brown, the umbilicus dull, surrounded by a blackish ring (which is rare in 2566). Heart-wood grayish brown.—a. *uncinata* Ram. Bosses of the scales on the lower side of the cone larger than those which are turned towards the trunk, recurved in the form of a hook or hood. (Cones unsymmetrical.)—b. *Pumilis Hänk.* Bosses at most hemispheric, the umbilicus, at least on the underneath scales, eccentric.—c. *Mughus Scop.* Bosses flat or raised to a right angle by the transverse keel; umbilicus central; cones symmetrical.—Alp., subalp. and Jura, especially on calc. rocks and peat-mosses, descending to 600 m above sea-level; b. the most widely spread form in Switz.; a. in the Alp. of Graub., Wall. and Vaud, where it becomes a tall tree; in the Jura it is only found as a shrub or an obliquely ascending tree; c. only eastwards from the upper Engadine (Val Chiamuera). 6 . . . **montana Mill.** 2568.

OBS. The following is often cultivated in shrubberies: *P. Strobis* L. (Weymouth Pine).—Hybrid: *P. montana-sylvestris*? (*Friesiana* Wich., *rætica* Brügg.).

673. *Abies*. Fir. XXI, 5.

1. Ls in clusters of 15—30 (solitary on the twigs of the current year), soft, deciduous in autumn. *Pinus Larix* L., *Larix decidua* Mill. Larch.—Alp. and subalp., up to 2300 m, especially in G. and W.; also cultivated. 6
Larix Lam. 2569.
- Ls isolated, evergreen 2
2. Ls disposed equally all round the twigs, compressed-4-cornered, mucronate. Cones pendant. Heart-wood of the trunk brown, scaly. *Pinus Albies* L., *Pinus Picea Duroi*. Spruce-fir.—Forests, up to 1800 m and higher. 6
excelsa Dec. 2570.
- Ls of the lower twigs (which bear no fr.) pectinate-distichous, flat, notched at the tip, with 2 white, longitudinal, lines below; disposed all round the fr.-bearing twigs at the top. Cones erect. Heart-wood of the trunk light gray, remaining, for a long time, smooth. *Pinus Picea* L., *Pinus Abies Duroi*. Silver-fir.—Forests, up to 1500 m. 5 **pectinata Dec.** 2571.

123. Marsiliaceæ.

674. *Pilularia*. Pill-wort. XXIV, 3.

1. Stem creeping. Ls subulate (reed-like), 5—10 *cm* long.
—Inundated places; Bonfol in Porrentruy. 6
globulifera L. 2572.

675. *Marsilia*. *Marsilia*. XXIV, 2.

1. Stem creeping. Ls long-petioled, div. into 4 obovate-cuneiform, entire leaflets.—Standing water; Villeneuve, Bonfol. 6 . . . *quadrifolia* L. 2573.

124. Isoëteæ.

676. *Isoëtes*. Quillwort. XXIV, 3.

1. Ls dark green, stiff, 10—15 *cm*. Macrosporangia with a band of not very prominent callosities.—Under water, in lakes and ponds; Schwarzwald, Vosges, Lago Maggiore and probably also in Tess. 7 . . . *lacustris* L. 2574.
- Ls light green, wavy, 5—10 *cm*, more finely acuminate than in the last. Macrosporangia thickly covered with thin spine-like prolongations.—As the last and often in company with it; between Locarno and Magadino. 7
echinospora Durieu. 2575.

125. Selaginellaceæ.

677. *Selaginella*. *Selaginella*. XXIV, 6.

1. Ls ciliate-denticulate.—Alp., subalp. and Jura. 7, 8
spinulosa A. Br. 2576.
- Ls entire.—Alp. and subalp., also in the valleys, but in general less common than the last. 7 *helvetica* Spring. 2577.

126. Lycopodiaceæ.

678. *Lycopodium*. Club-moss. XXIV, 6.

1. Sporangia in the axils of ordinary ls. Ls erect or (v. *recurvum*) spreading horizontally or curved back.—Alp., subalp. and Jura. 7 . . . *Selago* L. 2578.
- Sporangia united in terminal spikes, in the axils of bracts of a different form to that of the ls . . . 2
2. Ls toothed, spreading horizontally or deflexed.—Woods of the mount.; scattered (wanting in S.). 6
annötinum L. 2579.

- Ls with entire edges 3
- 3. Spikes solitary, sessile 4
- Spikes 2—6 together on a common peduncle 5
- 4. Bracts formed differently to the ls, broad-oval. Stem 30—70 cm.—Alp. and subalp.; Chasseron, Voirons. 7
alpinum L. 2580.
- Bracts differing but little from the ls, only with broader base. Stem 5—15 cm.—Peat-mosses; here and there (wanting in T. S.). 7 **inundatum L. 2581.**
- 5. Ls all of the same form, arranged spirally in several rows, terminated by a long capillary point.—Mossy woods, especially on siliceous soil and in the mount. and subalp. 7 **clavatum L. 2582.**
- Ls of the branches arranged in 4 rows, not terminating in a hair point. Type of *L. complanatum* (also, according to Bernoulli, number 2580) 6
- 6. Central branch barren, lateral branches alone bearing spikes; the other barren, branches spreading like a fan.—Forests; doubtful for Switz. 7 ***complanatum L. 2583.**
- Central branch bearing a spike; barren branches almost parallel, equal in height, narrower.—Tess. 7
Chamæcyparissus A. Br. 2584.

127. Equisetaceæ.

679. Equisétum. Horse-tail. XXIV, 4.*)

- 1. Stems all of the same form and appearing at the same time, green, the branches having a central hollow 2
- Stems differing in form: the fr.-bearing ones not green, at any rate at first, and very unlike the barren stems; branches without the central hollow 7
- 2. Spike mucronate. Stem more or less rough, gen. standing the winter 3
- Spike obtuse. Stem smooth, or hardly rough, not standing the winter 6
- 3. Sheaths cylindric, closely applied (rarely rather loose) 4
- Sheaths enlarged above like a cup 5
- 4. Teeth of the sheaths falling early and only leaving an obtusely crenate edge. Stem (gen. simple) between the thickness of a goose's quill and a little finger, with 18—20 furrows.—b. *paleaceum Schleich*. Stem slenderer, with 10—12 furrows; sheaths rather loose.—Damp woods, marshes; scattered (wanting in T. U.). 4 **hiemale L. 2585.**

*) See below a second table.

- Teeth of the sheaths lanceolate-subulate, persistent, rough-prickly. Stem slenderer than in the last, with 10—12 furrows.—Wollmatingerried near Constance, close to the Swiss frontiers. 4 . ***trachyodon A. Br.** 2586.
- 5. Sheaths surrounded by a black circle. Stem standing the winter, 10—20 *cm*, rarely more, branchy gen. only at the base, simple above, with 5—8 (rarely 12) furrows.—Sandy places; water-sides; distrib. 6
variegatum Schleich. 2587. *)
- Sheaths all of one colour or brownish above. Stem ann., 50—120 *cm* and more, at most the thickness of a goose's quill, gen. slenderer, branchy, rarely simple. *E. ramosum* Dec.—Sandy places, water-sides; not everywhere (wanting in B. O. U. L. S.). 4 . **ramosissimum Desv.** 2588.
- 6 (2). Stem fairly slender, furrowed, gen. branchy. Sheaths loose, with 5—8 teeth; teeth lanceolate, broad-scarious.—Ditches, water-sides; distrib. 6 . **palustre L.** 2589.
- Stem rather thick, smooth or only streaked, gen. simple. Sheaths closely applied, with 15—20 teeth; teeth subulate, narrow-scarious.—Ponds, ditches; distrib. 5
limosum L. 2590.
- 7 (1). Fertile and barren stems developing at the same time, the former turning green later and bearing branches 8
- Fertile stems appearing before the barren stems, always without branches, and dying after maturity . 9
- 8. Sheaths of the fertile stems infundibuliform, with 10 to 15 teeth. Branches of the barren stems gen. not ramified.—Shady places; G. W. (Engadine; Simplon, Saas, Zermatt, Anniviers, Sion). 4 . **pratense Ehrh.** 2591.
- Sheaths of the fertile stems almost campanulate, cleft in 3—6 parts (divisions each composed of 2—4 united teeth). Branches of the barren stems very fine, arched-pendant.—Damp woods and pasturages, especially in the mount. and subalp. 4 . **sylvaticum L.** 2592.
- 9. Sheaths of the fertile stems bearing 20—30 teeth. Barren stems often almost as thick as a little finger, ivory-white. *E. maximum* Lam.—Damp, shady places, forest-brooks; distrib. 3. . . **Telemateia Ehrh.** 2593.
- Sheaths of the fertile stems bearing 8—11 teeth. Barren stems green or greenish white, slenderer.—Fields, roadsides; everywhere. 3 . . **arvense L.** 2594.

Second table.

- 1. Fertile stems simple, whitish or brownish. *E. arvense* and *Telemateia*.
- Fertile (and barren) stems gen. branched, green 2

*) *E. scirpoides* Michx. See the appendix and N. Beitr. II, 12.

2. Stem (very thick) ivory-white. Sheaths with 20—30 teeth:
E. Telemateia.
 - Stem green. Sheaths with 3—20 teeth 3
 3. Branches very fine, ramified: *E. sylvaticum*.
 - Branches (when present) gen. simple 4
 4. Spike always mucronate. Stem more or less rough:
E. hiemale, *variegatum* and *ramosissimum*.
 - Spike gen. obtuse. Stem smooth or hardly at all rough 5
 5. Stem fairly thick, central hollow large, several times as large as the vallecular spaces. *) Sheaths with 15—20 teeth:
E. limosum.
 - Stem rather slender; the central hollow as large or narrower than the vallecular spaces. Sheaths with 5 to 15 teeth 6
 6. Stem gen. terminated by a spike; the first internode of the branches much shorter than the corresponding cauline sheath: *E. palustre*.
 - Stem without a spike; the first internode of the branches longer than the corresponding cauline sheath: *E. arvense*.
- OBS. Hybrid: *E. arvense-limosum* (litorale Kùhlw. inundatum Lasch.).

128. Ophioglosseæ.

680. Ophioglossum. Adder's-tongue. XXIV, 9.

1. Barren part of the frond oval-oblong, with entire edges, placed about the middle of the plant.—Damp meadows; rare (wanting in G. S.). 6 *vulgatum* L. 2595.

681. Botrychium. Moon-wort. XXIV, 9.

1. Barren part of the frond (when well developed) always petioled, inserted near the base of the plant 2
- Barren part of the frond sessile, placed about or above the middle of the plant 3
2. Barren part of the frond oval or obovate, rounded-obtuse, glabr., entire or incised.—Engelberg (Zabel)
* *simplex* Hitch. 2596.
- Barren part of the frond triangular in form, rather prolonged at the point, gen. 2-pinnatisect.—Chamouny. 6
* *rutæfolium* A. Br. 2597.
3. Cellules of the epidermis winding. Barren part of the frond triangular-oval, broader than long, 2-pinnatisect; segments of the second order anadromous (the first in the upper row, in the following species catadromous, i. e. the first in the lower row).—G. (Prättigau, opposite Sernäuserbad). *virginianum* Sw. 2598.

*) The channels opposite the furrows are called by this name.

- Cellules of the epidermis straight 4
- 4. Barren part of the frond placed about the middle of the plant, oblong, simply pinnatisect; segments half-moon-shaped, the base broad-cuneiform, entire or crenate, rarely (v. incisum in which the incisions sometimes reach to the middle or more) deeply incised.—Pasturages and hills, especially of the mount. and subalp.; distrib. 5 **Lunaria Sw. 2599.**
- Barren part of the frond placed above the middle (gen. just below the panicle) 5
- 5. Barren part of the frond rather thick, 2-pinnatisect; segments of the first order spreading, subobtuse. B. Reuteri Payot.—Bernardin, Bormio, Chamouny. 6
matricariæfolium A. Br. 2600.
- Barren part of the frond thin, pinnatisect; segments of the first order ascending, lanceolate, acute, narrowed towards the base.—Upper Engadine near Pontresina, herb. Boiss., according to a manuscript note by Milde
lanceolatum Angstr. 2601.

129. Osmundaceæ.

682. Osmunda. Royal-fern. XXIV, 8.

1. Fronds yellowish green, 2-pinnatisect. Pl. 10—15 dm high.—Marshes in transalpine Switz. 6 **regalis L. 2602.**

130. Polypodiaceæ.

683. Polypodium. Polypody. XXIV, 22.

1. Fronds simply pinnatisect; segments oblong-lanceolate, entire or toothed.—b. serratum Willd.—Fronds larger or broader; secondary nerves 3—4 (instead of 1—2) times dichotomous (St. Triphon!).—Woods; on rocks and tree-trunks; distrib. 6 **vulgare L. 2603.**

684. Gymnogramme. Gymnogramme. XXIV, 14.

1. Fronds stiff, coriaceous, 2-pinnatisect, thickly covered with scales underneath, at first of a silvery gray, then reddish brown. Notochlæna Marantæ R. Br.—Walls; T. (Cavigliano!); also on the southern and eastern frontiers (Vintschgau, Veltlin, Como, Aostathal). 4
Marantæ Mett. 2604.

685. Allosórus. Parsley-fern. XXIV, 16.

1. Fronds 10—20 cm, 3-pinnatisect; fertile segments almost linear, rolled under at the edges. Cryptogramme

crispa R. Br.—Alp, on granite; G. T. W. V. O. U. 7
crispus Bernh. 2605.

686. Adiantum. Adiant. XXIV, 16.

1. Fronds very delicate, 2-pinnatisect; segments obovate-cuneiform, inciso-lobed.—Damp rocks; transalpine Switz. Vaud (La Sarraz), Neuchâtel (St. Aubin). 6
Capillus Veneris L. 2606.

687. Pteris. Brake or Bracken. XXIV, 12, 16.

1. Fronds all of the same form, triangular-oval, 2—3-pinnatisect. Pl. 70—150 *cm*. *Pteridium aquilinum* Kuhn.—Thickety pasturages, peat-mosses. 7 *aquilina* L. 2607.
- Fronds of 2 forms, simply pinnatisect, 30—50 *cm*; segments in 3—5 distant pairs; those of the barren fronds linear-lanceolate, denticulate-mucronulate; those of the fertile fronds much narrower, linear, with entire edges. Damp rocks; T. (Gandria, Locarno). 7 *crética* L. 2608.

688. Blechnum. Blechnum. XXIV, 11.

1. Fronds simply pinnatipartite or pinnatisect; the barren ones lanceolate in contour, narrowed at both ends, with numerous linear-oblong, entire segments; the fertile ones higher, with narrower, more distant segments.—Woods; distrib. 7 . . . *Spicant* Sm. 2609.

689. Scolopéndrium. Hart's-tongue. XXIV, 17.

1. Fronds rather shortly petioled, long-lanceolate, cordate at the base, gen. entire. *S. officinarum* Sw.—Damp, shaded rocks; distrib. (wanting in S.). 6 . *vulgare* Sm. 2610.

690. Asplénium. Spleenwort. XXIV, 20.

1. Fronds 5—15 *cm*, with 2—4 linear segments incised at the top.—Granite rocks, erratic blocks, not common (wanting in L. S.). 6 . *septentrionale* Hoffm. 2611.
- Fronds 1—3-pinnatisect (in *A. Ruta muraria* the segments are sometimes few, but broad) . . . 2
2. Fronds (5—15 *cm*) short-petioled, simply pinnatisect, linear in contour (segments oval-rhomboidal or suborbicular, numerous, as many as 30 on each side) . 3
- Fronds, at least at the base, 2-pinnatisect, not linear in contour; petiole gen. as long as, or longer than, the frond 4
3. Rachis stiff, black-brown, narrowly winged; segments sessile, finely crenate, rarely (*v. incisum*) pinnatifid.—Rocks and walls; everywhere. 6 *Trichómanes* L. 2612.
- Rachis herbaceous, green, not winged; segments shortly stalked, of a lighter green and more deeply

- crenate than in the last.—As the last, especially in the mount. and subalp.; distrib. 6 **viride Huds.** 2613.
4. Fronds (5—15 *cm*) narrow-lanceolate in contour, 2 pinnatisect at the base, from the middle to the top simply pinnatisect. About intermediate between 2611 and 2616; segments more numerous than in the first (4—10), narrower than in the last; indusium entire at the edges. *A. Breynii* Retz.—Granite rocks in the mount. and subalp., rare, gen. in company with *A. sept.* and *A. Trichom.* (according to Ascherson and Loret a hybrid between these 2 species, according to Bory = *A. rut. mur.* — sept.) G. T. W. O. A. 6 **germanicum Weiss.** 2614.
- Fronds 2—3-pinnatisect **5**
5. Fronds (15—25 *cm*) linear-lanceolate in contour, narrowed at the base (lowest pair of pinnæ shorter than the central ones); pinnules short, with mucronate teeth. *A. Halleri* Dec.—Rocky places, especially on calc.; Tess., Rhone-valley, Salève, Jura, from Geneva to the Ramsfluh and Lägern, lake of Wallenstadt. 6 **fontanum Bernh.** 2615.
- Fronds triangular-oval in contour, or oval-lanceolate, the lower divisions longer than the middle ones **6**
6. Rachis green, or only black-brown at the base. Fronds 5—15 *cm*, dull; segments of the last order oblong-obovate or rhomboidal-cuneiform, obtuse, crenate-toothed in front. Tegument ciliate. Very variable.—Walls and rocks; everywhere. 4 **Ruta muraria L.** 2616.
- Rachis black-brown to above the middle. Fronds 10—30 *cm*, shining above, the point elongated; segments of the last order obovate-cuneiform, toothed at the top. Tegument with entire or wavy edges.—As the last, but much rarer and especially in the mount. and subalp. regions (wanting in Z. S.). 6 **Adiantum nigrum L.** 2617.

691. *Athyrium*. *Athyrium*. XXIV, 20.

1. Tegument distinct. Ls 6—12 *dm*, oblong-lanceolate, light green, 2-pinnatisect, with pinnatifid segments. Differing from 2629 both in its more finely divided ls and its more glabr. rachis.—Woods; everywhere. 7 **Felix femina Roth.** 2618.
- Tegument very small and only visible in its first youth. In other respects the pl. resembles the last. *Aspidium alpestre* Nyl.—Alp., subalp. and Jura, sometimes together with the last. 7 **rhæticum (L.) Grml.** 2619.

692. *Céterach*. *Ceterach*. XXIV, 14.

1. Fronds 5—15 *cm*, rather coriaceous, shortly petioled, pinnatipartite, with alternate, oval or oblong, segments,

officinarum Willd. 2620.

693. **Phegóptēris. Phegopteris.** XXIV, 22.

- Robertianum A. Br. 2623.

694. **Aspídium.** Shield-fern, XXIV, 21.

- montanum** Aschers. 2625.

4. Fronds glandular-spotted underneath, oblong-lanceolate in contour, 2-pinnatisect, with mucronate teeth.—calc. dèbris in the Alp.; Suchet, Marchairuz and Dôle in the Jura. 7 . . . **rigidum Sw.** 2626.
 — Adult fronds glandless underneath, or at any rate broader in outline, oblong or triangular 5
5. Fronds simply pinnatisect, with pinnatifid or pinnatifid segments; contour of the fronds oblong or oblong-lanceolate 6
 — Fronds 2—3-pinnatisect, triangular-oval or oblong-oval in contour with mucronate teeth; petiole long.—b. *dilatatum Sw.* Fronds broader, dark green, 3- or almost 4-pinnatisect; petiole covered with darkerscales.—Woods, peat-mosses; distrib. 6
 **spinulosum Sw.** 2627.
6. Fronds of 2 forms, rather long-petioled, contour narrow-oblong. Segments of the first order distant, with broad base, almost triangular-lanceolate. Segments of the second order 6—10 on each side, the teeth short-mucronate. Petiole with scattered scales. Fertile fronds longer, the lobes vertical to the limb.—Peat-mosses, rare; Bern, Thun, Wauwylermoos (Suppiger, Lüscher), Robenhausen. 7
 **cristatum Sw.** 2628.
 — Fronds uniform, rather short-petioled, oblong-lanceolate in contour; segments of the first order crowded, long-lanceolate, acuminate; segments of the second order 15—25 on each side, the teeth not mucronate. Petiole very thickly covered with scales. Male fern.—Woods, everywhere. 6 **Filix mas Sw.** 2629.
- 7 (1). Fronds simply pinnatisect, stiff, lanceolate in contour; pinnae sickle-shaped, curved at the top, teeth almost spiny. Holly fern.—Rocky, wooded slopes in the mount. and subalp. 7 **Lonchitis Sw.** 2630.
 — Fronds 2- or almost 2-pinnatisect. Type of *A. aculeatum* *) 8
8. Fronds hard, almost coriaceous, acuminate, more or less narrowed at the base; segments of the first order lanceolate, acuminate, gen. curved like a sickle towards the top, distinctly auricled at the base; the lower segment of the second order of the upper series much larger than the others.—Mountain woods, gorges; distrib. 6
 **lobatum Sw.** 2631.
 — Fronds softer, almost like paper, less acuminate than in the last, much narrowed at the base; segments of the first order broader, almost straight, indistinctly auricled at the base; the lower segment of the second order of

*) The true **A. aculeatum Sw.** (*aculeatum Swartzianum Koch*) is not found in Switz. See N Beitr III, 51.

the upper series scarcely larger than the others. *A. Braunii* Spenn.—As the last; hitherto only in the valleys of Hasli, Engelberg and near Ponte Brolla in Tess. 6
angulare Kit. 2632.

695. *Cystopteris*. Bladder-fern. XXIV, 21.

1. Frond solitary, triangular in contour, almost as broad as long (resembling *Phegopteris Dryopteris*).—Rocky and mossy places in the Alp., subalp. and (southern) Jura. 7
montana Bernh. 2633.
- Fronds clustered, oblong or oblong-oval (very rarely triangular) in contour. Type of *C. fragilis* 2
2. Most of the teeth of the pinnules not incised: the nerves mostly running into the teeth.—Walls and damp shady rocks; everywhere. 6 **fragilis Bernh. 2634.**
- Most of the teeth of the pinnules incised; the nerves very gen. running into the incisions. *C. regia* Koch. Alp. and subalp.; Dôle in the Jura. 7
alpina Link. 2635.

696. *Onoclea*. *Onoclea*. XXIV, 12.

1. Barren fronds resembling those of 2625, but not glandular, and, in addition, the lateral nerves of the lobules are simple (not forked). Fertile fronds much shorter, pinnatisect, with semi-cylindric segments. *Struthiopteris germanica* Willd.—Tess. (Val Maggia, Generoso). 6
Struthiopteris Hoffm. 2636.

697. *Woodsia*. *Woodsia*. XXIV, 18.

1. Fronds lanceolate, pinnatisect, with pinnatifid segments. Petiole and part just below the frond very scaly.—
a. *W. hyperborea*. Segments of the second order 2—3 on each side, rather distant.—b. *W. ilvensis* R. Br. Fronds broader in contour, more thick with scales below; segments of the second order 4—6, crowded.—Alp. and subalp., rare; G. T. W. O. U. (a. Bevers in the Engadine, Simplon, Calanca, Faido &c.; b. St. Moritz in the Engadine). 7 **hyperborea R. Br. 2637.**



IV. Appendix.

List of those species which are indicated in various works as growing in Switzerland, which are not to be found or are very doubtful.*)

Achillea Clusiana Tausch., Switz., Heg. *A. dentifera* Dec Switz., Nym. (as also *A. tanacetifolia* All., *lanata* Sprgl. and *compacta* Lam.) *A. Herba rota* All. Graub. *A. odorata* L. Switz. *A. serrata* Retz. Switz., Willd.; gr. St. Bernard: Tissière. *Agave americana* L. Rocks near Gandria in Tess. *Aira provincialis* Jord. south-western Switz., Nym. *Aldrovanda vesiculosa*; in one or two of the Swiss lakes, "der Gesellige" No. 139, 1882; see "Frontier Plants". *Alisma natans* L. Bâle. *Alopecurus utriculatus* L. Tess., Delle. *Alsine arvatica*. (Arenaria Presl., conferta Jord.) S. Triphon: Rchb. according to the synonym of Haller n. 870, but which surely belongs to *A. Jacquini*. *A. grineensis* Gr. Godr. (Mœhringia Thomasiana Gay. Bert. 6. 625.) southern Switz., Nym. *A. Villarsii* M. K. Switz., Heg.; Pilatus, Steiger. *Alyssum argenteum* Vitm. between the Val Tornanche and Chatillon in Wall. Heg. *A. campestre* L. Wall. *A. minimum* Willd. Wall.? Koch. *Amarantus hybridus* v. *helveticus* Willd. Switz. *Andropogon distachyus* L. Tess. Schleich. *Antennaria alpina* Gärtn. High Alp., Heg. Engadine, Heer. *Anthemis austriaca* Jacq. Tess. *Antirrhinum-Asarina* L. Geneva. *A. latifolium* Mill. Neuchâtel, Benth. in Dec. prodr. *Aquilegia Bauhini* Schott (Einseleana F. Schultz, pyrenaica Gaud. not Dec.), Lugano. *Arabis Gerardi* Bess., Faulhorn, Heer niv. Fl. Schwz. 96, 105. *A. verna* L. see N Beitr. I, 35. *Aristolochia pallida* Willd. Valle Bergami C. Tess. Koch. *A. Pistolochia* L. Tess. Heg. *Armeria vulgaris* Willd. Valleys of the southern Alp. Heg. *Arundo Donax* L. Scolochloa Donax Gaud.) Tess. *A. Pliniana* Turr. Switz, R. B. Z. 1823. *Asperula laevigata* L. Swiss Alp., Laich. *Astragalus Gerardi* (Phaca-Vill.). High Alp. Heg. Dauphiné. *A. purpureus* Lam. Mt. Rosa, Bert. *Atriplex nitens* Schk. Bâle, Wirtg. Rhine. Reiseff. *A. oblongifolia* W. K. Bâle, Heer. *Avena sesquitertia* L. (amethystina Clar.). Foot of the Gemmi; Alioth in litt. *A. lucida* Bert. (differing from *A. pubescens*, it is said, in the spikelets being almost only $\frac{1}{2}$ the size and the ls narrower) Generoso, Caruel, Penzig.

Barkhausia alpina Dec. M. Generoso. *B. recognita* Hall. f. Nyon, Gaud., perhaps adventitious, as at Besançon and in Alsace! *Betula humilis* Schrank. in turfosis subalpinis

*) For doubtful hybrids see N. Beitr. III, 26.

Regel in Dec. prodr. *Briza minor* L. Vevey. *Buffonia perennis* Pourr. Wall. Nym. *B. tenuifolia* L. (with macrocarpa) Wall., Willk. Führer, 2nd edit. *Bulliarda Vaillantii* Dec. Bâle. *Bupleurum angulosum* L. (pyrenæum Gou.) Wall. See Gr. Godr. *B. aristatum* Bartl. (Odontites Gaud. not L.). Wall. *B. graminifolium* Vahl. (petræum Gr. Godr. nec Rchb.)*) Tess. *B. junceum* L. Sion, Bâle. *B. tenuissimum* L. Bâle.

Calamintha thymifolia Rchb. Switz, Koch Taschenbuch. *Campanula Allionii* Vill. Wall. *C. alpina* L. Graub. Scheideck. *C. cæspitosa* Scop. Nicolaithal, Gay and E. Thom. in Gaud. syn. ed. Monnard. M. Generoso, Penzig. *C. Elatines* L. Andermatt; see N. Beitr. III, 22. *C. linifolia* Lam. nec alior. Switz. Ducom. Mont d'Or in the Jura? Gren. (*C. linifolia* Scop. = *C. carnica* Schiede in Tyrol). *Capparis spinosa* L. transalpine Switz. Heg. *Cardamine dentata* Schult. Wunachthal, Merkl. Verz. *C. thalictroides* All., see N. Beitr. I, 34. At Brevent, Mt. Blanc, St. Lager, according to Just Jahresber. 1882. 704. *Carduus arctioides* Willd. Val Bevers and Bernina, Moritzi; Schatzalp. Fl. von Davos, Geissler. *C. hamulosus* Ehrh. Switz. Gris. according to Nym. *Carex baldensis*, Wall., Eginenthal, Lagger. *C. Bertolonii* Schk. (Switz, Schk. *C. lævigata* Sm. Switz. Gaud. *C. Linkii* Schk. (gynomane Bert.) Mt. Generoso, Thom. *C. Schreberi* Schrank Tess, Bâle, Alsace; "Abbona a preferenza nella Lombardia e nella Svizzera Italiana" Parlat fl. it. II, 138. *Centaurea aspera* L. southern Switz. Heg. *C. Cineraria* L. Lower Engadine, Bâle. *C. Stæbe* L. (Tess.?) between Louèche and the baths, C. Stein. *C. uniflora* L. Graub. *C. variegata* Lam. (seusana Chaix) southern Switz. Nym. *Cerastium campanulatum* Viv. Wall. Schleich. according to Rchb. *C. Boissieri* Gren. Wall., Engl. Entwickl. d. Pflanzenreichs (Alpes vaudoises of Piémont!). *Cerinth minor* L. Pfirt, Aarau. *Chærophyllum aromaticum* L. Balgach, Canton St. Gall, Custer. *Ch. bulbosum* L. Bâle, Bern. *Cheilanthes fragrans* Hook. Tess., between Domo d'Ossola and Villa, Milde. *Chrysanthemum coronarium* L. (Pinardia coronaria Less.) La Combaz in Wall. *Cirsium anglicum* Lam. northern Switz. Lohr. *C. canum* Bieb. southern Switz. Heg. *C. pannonicum* Gaud. Mt. Generoso, Gaud. *Clematis Flammula* L. Graub. *Cnicus benedictus* L. Wall. *Cnidium venosum* Koch. Jura, Koch, Heg. *Conringia austriaca* Andrz. Val d'Entremont, Schleich. according to Heg. *Corynephorus articulatus* Beauv. Tess. Lohr. *C. canescens* Beauv. Geneva, Bâle, Schaffh. *Corydalis pumila* Rchb. Chiasso, Canton Tess., Franzoni in Grml. Beitr., according to an oral communication from Muret, but very doubtful. *Crepis pulchra* L. French Jura, Aostathal, Tyrol, Wurtembg.,

*) *B. petræum* Rchb. = *B. stellatum* according to Rchb. f.

Alsace, also all round Switz. *Crocus luteus* Lam. Appenz., Glar. *Cuscuta approximata* Babg. Switz. Engelm. *Cytisus sessilifolius* L., between Como and Bellinzona, Chillon, Freibg.

Dentaria enneaphyllos L. Switz., Heg. *Dianthus liburnicus* Bartl. Tess. or Veltlin, Heg. Switz. Willk. Icon. hisp. Münsterthal, Lehmann, stud. med., oral communication. Littoral plant! *D. neglectus* Lois. (glacialis Gaud.) Umbrail, Alp. of Glarus. *D. sylvaticus* Hopp. Switz. Borbas (*D. sylvaticus* Suppiger in Steiger Fl. according to Mühlberg = *barbatus*). *Draba Aizoon* Wahlb. Subalp., especially in the warm parts of Switz., Heg. *D. nemoralis* Ehrh. Switz. Schleich. according to Heg. *D. stellata* Jacq. Wall. and Graub., Heg. Wormserjoch, Moritzi. Ex editis montis Generoso ad Larium, Bert., Penzig.

Elatine major A. Br. Graub. *E. triandra* L. Bâle. *Elodes palustris* Spach. Switz., Nym. *Endoptera Dioscoridis* Dec. (*Crepis globifera* Hall. f.) Neuchâtel, Zofingen, Bâle. *Endymion patulus* Gr. Gd. (*Scilla patula* Gaud.) Switz. near Chamonix. Reh. *E. non scriptus* Gark. (*nutans* Dumort. *Hyacinthus* Hall. n. 1248) Montreux, Hall.; in 1877 I found one specimen above Vevey. *Erica arborea* L. Tess. *Erodium Ciconium* Willd. Wall., Heg. *Erysimum canescens* Roth., Wall. (the pl. of the Aostathal appears to be *E. australe* Gay). *Equisetum scirpoides* Michx. Schöllenen, Andermatt, Karsten pharm. med. Botanik 282. *Euphorbia Esula* L. Switz. *E. peploides* Gon. Aigle. *E. serrata* L. in agro Ticinense Helvet; Muret according to Boiss. Dec. prodr.; wrongly indicated according to an oral communication of Muret! *Euphrasia tricuspidata* L. Graub., Heg.

Festuca flavescens Bell. nec Host. between the Creux de Jaman and the Col de la Vire, Gay according to Gaud. syn. ed. Monn.; true? *F. vaginata* W. K. Wall., Gaud. *Fumaria parviflora* Lam. Baden, God.

Gagea bohemica, *pusilla* and *spathacea* Schult. all 3 in Switz., Heg. *Galega officinalis* L. Graub., Lausanne, Aarau, Randen. *Galium hypnoides* Vill. Reculet, Cariot. *G. obliquum* Vill. (*myrianthum* Jord., *pallens* Thuill.) south.-west. Switz., Nym. *Gentiana prostrata* Hänk. Albula, Loretz according to Vulpus O. B. Z. 1858. *Geranium macrorrhizum* L. Brünig, Vulpus. *Gladiolus illyricus* Koch. Tess.? *Gymnogramme leptophylla* Desv. Salève in Switz., herb. Schleich according to Milde. *Gypsophyla fastigiata* L. Septimer, transalp. Switz., Thom. in herb. Burnat!

Hacquetia Epipactis Dec. At the foot of the greater St. Bernard, Koch (Italian side!). *Helianthemum marifolium* Dec., Swiss Jura, Dec. fl. fr. *Helosciadium inundatum* Koch., Noville near Roche. *Helichrysum arenarium* Dec., Tess.? Heg. Switz., Nym. *H. Stoechas* Dec. Blonay, Gaud. *Heracleum*

austriacum L. Albula, Loretz according to Vulpinus. N. Beitr. IV, 210. *Heliosperma alpestre* Rchb. Graub.? Heg. *Herniaria incana* Lam. Bâle, once, Hagenbach. *Hieracium diaphanum* Fr. (sylvaticum integrifolium Christener?) Upper Engadine, Montbovon, Wetterhorn (silv. int.). Jura, Gren. according to Christener in a letter *H. dinaricum* Fr. Switz., Nym. *H. echioides* Lumnitz. Wallis, Schleich. according to Gaud. syn. *H. flagellare* Willd. (stoloniflorum Koch p. not W. K.) western Switz., Heg. *H. porrifolium* L. Tess., Koch. *H. pumilum* Lap. (breviscapum Dec), Gr. St. Bernard, Tiss. B. S. M. 4, 63. *H. ramosum* W. K. Jorat (not Jovat), Koch, evidently taken from Suter's fl. helv. ed. Heg. *H. saxifragum* Fr. Switz., Nym. *Hierochloa australis* R. Sch., Switz., Nym. *Hippocrepis unisiliquosa* L. Geneva. *Homogyne discolor* Cass. Switz., distrib. Heg. *Hypochaeris glabra* L. Bâle.

Jasione perennis Lam. Tess. Heg. *Jasminum fruticans* L. Rocks near Neuchâtel and Lugano, Heg. *J. grandiflorum* L. Tess., in vineyards, here and there as if indigenous, Heg. *Iberis umbellata* L. Nyon, Gaud. *Inula montana* L., Creux du Van, Glarus *I. helenioides*, see N. Beitr. I, 35. *Juncus atratus* Krock. Zugerberg, Bamberger (evidently invented!). *J. tenuis* Willd. Mt. Generoso, Penzig.

Laserpitium alpinum W. K. Graub. between Reichenau and Thusis, Vill. according to Gaud. syn. Graub. Heg. *L. marginatum* W. K. Mt. Generoso, Ct. Tessin, and Hinterrhein in Graub., Koch. *L. nitidum* Zant. (hirtellum Gaud.) Tess., Rchb. f. *L. peucedanoides* L. Tess., Koch, Rchb. *Lathyrus angulatus* L., Branson. *Lavatera thuringiaca* L. Tess. and Veltlin, Heg. (wanting in Italy!) *Lemna arrhiza* L. Sursee. *Leontodon alpinus* Vill., Wall. Annal. soc. bot. Lyon. 1878. *Lepidium subulatum* L., Wall. *Limnanthemum nymphoides* Link. Bâle. *Lilium candidum* L. Neuveville and Canton Neuchâtel, become spontaneous, Gaud. *Linaria purpurea* Mill. Romainmotier, Monnard in Gaud. syn. *L. supina* Desf. Val Lens, Thom. according to Gaud. syn. *Lindernia pyxidaria* L. Geneva, Bâle. *Linum narbonense* L. Mt. Generoso, Ducomm. *Lupinus angustifolius* L. Echallens, Vaud. *L. albus* L. Tess., cultivated as fodder, Heg. *Luzula glabrata* Hopp. Appenzell in the Wagenlucke, passing over to *L. spadicæa*, C. Stein. *L. parviflora* Desv., Switz, Nym. *L. pediformis* Dec., Simplon, E. Meyer.

Malva borealis Wallm., Switz., Heg., Lucerne, Steiger. Wurtemberg! *Mandragora officinalis* Mill., Mt. Generoso. *Melilotus dentata* Pers., Bâle, Schleich. *Mæhringia diversifolia* Dollin. Mt. Generoso, Penzig. *Myosotis repens* Don. Switz., Heg. Canton Vaud, Dur. Pitt. (A good species according to Hooker and Lange.) *M. sparsiflora* Mik. Switz.,

Heg. *Myriophyllum alterniflorum* Dec., Noville near the lake of Geneva, Charpent. according to Rchb.

Narcissus odoratus L. Geneva. *Nepeta Nepetella* L. (lanceolata Lam.) Southern valleys of the Alps, Heg. *Nuphar Spenerianum* Gaud. Constance? Heg. Zürich, Sendtner R. B. Z. 1858. Schmidtmoos near Amsoldingen, Fischer-Ooster. according to Jaccard in correspondence.

Oenanthe silaifolia Bieb. Switz., Heg. *Oenothera muricata* L., Bâle, Moritzi. *Ononis hircina* Jacq. Wall. *Orchis provincialis* Balb., Tessin. *Ornithogalum sphærocarpum* Kern. (pyrenaicum Koch not L.) Switz., Nym. Bâle, Wirtg. Rhein. Reiseff. *Orobanche pallidiflora* W. Gr. Graub., Rhiner. *O. procera* Koch, Switz.? Heg. *O. pruinosa* Lap. Tess.? Heg. Branson in Wall., found in 1847 by E. Brown, verified by Reut.: Burnat manuscr., but this locality is omitted by Reut. in Dec. prod. *Ostericum palustre* Bess. Switz.? Heg. *Oxytropis pyrenaica* G. G. Mt. Generoso, Penzig.

Pæonia corallina Retz. Tess., Ducom. *P. officinalis* Retz. Mt. Generoso. *Pedicularis comosa* L. Tess.? Heg. *P. Hacquetii* Graf, Tess., Lavizzari. *P. Sceptum Carolinum* L. Binningerried, near the frontier of Canton Schaffhausen, still there in 1851, disappeared since 1859. *Petroselinum segetum* Koch. Val Erguel, Hall.; found near Bex in 1877 by Favrat and Vetter, evidently accidentally introduced. *Peucedanum alsaticum* L. Western and transalpine Switz., Heg. *P. officinale* L. Swiss Jura, Kirschleger, later revoked. *Phlomis tuberosa* L. Switz.? Ducom. *Phyteuma comosum* L. between Lugano and Porlessa, Ct. Tessin, Moritzi. *Ph. Charmelii* Vill. Mt. Generoso, Caruel, Penzig. *Pinguicula longifolia* Dec. (leptoceras var. Rchb. f.) Jura. Maritime Alps! *Plantago Coronopus* L. Geneva. *P. maritima* L. (graminea Lam.) Tess. and Engadine? Ducom. *Poa badensis* Hänk. Switz., Nym. *Podospermum calcitrapifolium* Dec. Wall. (not in Alsace). *Polygonatum latifolium* Desf. Glarus, Heer in Heg. suppl. *Polygonum Bellardi* All. Wall., Tess., Heg. *Potamogeton polygonifolius* Pourr. (oblongus Viv.) Switz., Nym. *P. rutilus* Wulfg. Switz., Nym. *P. spathulatus* Schrad. Marais de Rolle, Thom. according to Rchb. *P. trichoides* Cham. Schlecht. Constance, Döll Rhein. Fl., revoked in the Fl. v. Bad. Ditches near Bregenz, Sauter according to Rchb. Icon. *Potentilla cinerea* and *P. subacaulis* L. Switz. Tratt. ros. *Preslia cervina* Fres. Lausanne. *Primula Clusiana* Tausch. Northern Switz., Nym. *P. Flærkeana* Schrad. (glutinosa-minima) Engadine, Ducom.; the pl. of Heg. is *P. Muretiana*. *P. marginata* Curt. Wall., Graub., Heg. *P. minima* L. Gotthard, Graub. *P. pedemontana* Thom. Wall., Graub., Heg. and according to him Koch. Lesser Schiahorn near Davos, Geissler. *P. spectabilis* Tratt. (intermedia Heg. ex Rchb. f.) Tess., Heg. *Prunus Chamæcerasus* Jacq. Warm parts

of Switz., Heg. *P. Laurocerasus* L. Tess. and Veltlin, subspontaneous. Heg. *Pulmonaria sacharata* Mill Switz., Miller. *P. ovalis* Bast. Genthod, Déséglise; according to Kerner hybrid between *P. affinis* Jord. and *longifolia* Bast.

Quercus Ilex L., transalpine Switz. Koch.

Ranunculus Baudotii Godr. Wall., Willk. Führer, second ed. *R. cassubicus* L. Graub. (*R. auricomus fallax* W. Gr. has been taken for this.) *R. crenatus* W. K. Graub. towards the Veltlin, Heg. *R. hederaceus* L. Pfirt. *R. pygmæus* Wahlb. Swiss Alp., Kittel. *Rapistrum perenne* All. Aargau, Ducom. *Rhamnus rupestris* Scop. Switz.? Heg. *Rhododendron Chamæcistus* L. Graub.? *Rhus typhinum* L. Tess. almost spontaneous, Heg. *Rubus affinis* W. N. Switz., Nym. (the pl. of the 1st edition of my Excursionsfl. appears to be *R. cæsius-thyrsanthus*). *R. Chamæmorus* L., a specimen of Schleicher's in the Leyden Herb., O. Kuntze, Methodik 153. *R. arduennensis* Lib. Excursionsfl. 3rd ed. is to be eliminated; *R. Mercieri* which Focke inserts there, is very different. *R. Sprengelii* W. N. Bern. Fischer-Ooster. *R. rhamnifolius* W. N. Switz., Grml. = *macrostemon*. *R. thyrsiflorus* W. N. Switz.? Nym. consp. *R. villicaulis* Kohl. Switz.? Nym. consp. *R. vulgaris* W. N. Switz., various authors. *R. Schleicheri* W. N. Discovered, according to the authors, in Switz. by Schleicher; we have hitherto seen no Swiss specimen. *Rumex domesticus* Hartm. Jura, Gr. God., revoked by omission in Gren. Fl. jur. *R. maximus* Schreb. (probably *aquaticus*-*Hydrolapathum*) Switz., Heg., Nym. *R. sylvestris* Wahlb. Schaffh. near Gennersbrunn, Merkl. Verz. (wanting in the Grand Duchy of Baden according to Döll; a more northern species). *Ruta montana* Vill. Tess., Pilatus.

Sagina nivalis Fr. see Beitr. 94. *Salix glabra* Scop. Graub., Vulpius. *S. undulata* Ehrh. (*alba-triandra*) Switz.? Gaud.; a rare hybrid hitherto almost exclusively found in the North of Germany! *Santolina Chamæcyparissus* L. Wall. *Saponaria Pumilio* Endl. Furca on the Uri-side, Moritzi according to Heer in Heg. suppl., revoked by the collector himself. *S. lutea* L. Southern Switz. in the Val Tornanche, Koch (Piémontese side!). *Saxifraga Burseriana* L. southern Switz., Engler Monogr. 1872. *S. apennina* Bert. (*cuneifolia subintegra* Ser. Engl.) Bernese Alps, Ser. *S. decipiens* Ehrh. (*cæspitosa* Koch nec auct. helv.) Berneck in the Rhine valley of St. Gallen, Christ. Verbreit. der Alpenpfl.; there is probably a confusion with Berneck in the Fichtelgebirge, where this species is found as well as the closely allied *S. sponhemica* Gmel.) *S. Hostii* Tausch. (*elatior* M. K.) Graub. at Umbrail and towards Bormio, Heg. *S. hypnoides* L. Gemmi. *S. sedoides* L. M. Vergy near Geneva, Engl. (wanting in Reuter's catal.); "habui ex Speluga in Rhætia", Bertol. *S. Hohenwartii* Sternb.

Switz., Schl. according to Heg. *S. umbrosa* L. Roßen in Graub., an ornamental pl.! *Scabiosa ochroleuca* L. Schaffh., Michelfelden near Bâle; wanting in the Gr. Duchy of Baden. See N. Beitr. III, 11. *Scilla autumnalis* L. Delsberg? Ducom. *S. verna* L. Kleinlaufenburg, A. Braun; it is *S. italica*. *Scirpus radicans* Schk. Grosne near Delle; Montandon according to Kirschl. fl. vog. rhén.; Bregenz, common, Sauter. *Scorzonera glastifolia* Willd. (montana Mut. Gaud. syn.) Switz. rare, Koch. *S. Candollei* Vis. (angustifolia Dec. prodr.) Southern Switz., Nym. *Scutellaria hastifolia* L. Switz., Heg. and according to him Gaud. *Sedum hirsutum* All. Roseggthal in the Engadine (probably confused with *S. dasphyllum*). *S. stellatum* L. Gex, Mt. Aubrig, Gossau. *Sempervivum hirtum* L. Switz.? Heg. *S. soboliferum* Sims. Switz.? Heg. *Senecio brachychaetus* Dec. (*Cineraria longifolia* Jacq.) Wall and Graub., Heg.; (this is the *Cin. tenuifolia* Gaud. ex loc. natal. (Lavirums), recently cited by Bouvier as *Sen. Balbisianus*. *S. fluviatilis* Wallr. (*sarracenicus* L. ex Koch) Switz., Linn. *S. subalpinus* Koch, Switz, Boiss. *Seseli athamantoides* (Libanotis atham. Dec. Koch; differing from *S. Libanotis* in its glabr. fr.) Switz., Heg. *Sesleria argentea* Sav. (elongata Host.) Tess., Heg. *Sesleria pedemontana* Boiss. and Reut. Helv. merocc. Valdensian Alps, Leresche and Centurier, Nym. consp. 796 (i. e. the Vaudois Alps of Piémont!). *S. sphærocephala* Ard. Southern Switz., Koch. *Sideritis montana* L. Tess.? Heg. *S. scordioides* L. nec Koch, Bâle. *Silene parviflora* Pers. Tess. towards Mendrisio, Heg. *S. nutans* v. *incana* Ser. in Dec. prodr. = *S. nutans-nemoralis*? Rchb., Wall.; *S. nemoralis* (more rightly *S. floccosa* Fic. sub. Cucubalo) is not found in Switz. *Siler trilobum* Crantz. St. Moritz? Heg. *Sinapis Cheiranthus* Koch. Bâle, Hagenbach; Branson in Wall., Bouvier. *S. dissecta* Lag. Villeneuve, once. *Sisymbrium polyceratium* L. Geneva, Bern, Bâle; found again in 1850 by Schlumberger near Grenzach, Kirschl. *Soldanella montana* Mik. Subalp., not rare, Heg. *Spergula pentandra* L. Bâle. *Sp. Morisonii* Bor. Switz., Nym. *Spergularia Dillenii* Lebel. (salina Presl. *Lepigonum salinum* and *médium* Nym.) Switz., Nym. *Spiræa obovata* W. K. Neuchâtel, especially on the walls of vineyards; widely distrib. in France in the Department of Cher, Gay, also doubtless spontaneous in Switz., Koch syn. add. *Stachys italica* Mill. Frontier of Tess. and Veltlin, Heg. *Stellaria neglecta* Weihe. Bremgarten, Aargau, Boll. *Subularia aquatica* L. Kleinrieden near Bâle, Gmel fl. bad. Vog.

Teucrium lucidum L. St. Bernard, Rchb. *Thalictrum elatum* Jacq. Switz., Hausm. *Th. medium* Jacq. Switz.? Regel. *Th. nigricans* Scop. Near Anet and along the Broie. *Th. rufinerve* Lej. Lake of Neuchâtel, God. *Th. sylvaticum* Koch.

Lower Engadine, Brügg. *Thesium ebracteatum* Hayne near Dörflingen, Schaffh. Heer in Heg. suppl. *Th. humifusum* Dec. Geneva, Gren. *Thalaspi cepæfolium* Koch. Baths of Louèche, Heg. Rawyl, Löhr. Zermatt, Koch. *Th. præcox* Wulf. Tess.? Heg. *Thrincia hispida* Roth. Glarus, Heer. Vaud, Gaud. *Tragopogon crocifolius* L. Gr. St. Bernard, Koch. (Italian side!) *Trifolium noricum* Wulf. Switz. *Triglochin maritimum* L. Switz. *Trigonella foenum graecum* L. Hementhal, Ct. Schaffh., subspontaneous, Gaud. Heg. *Trisetum alpestre* Beauv. Alp. and subalp., Heg. *Tulipa Gesneriana* L. and *Oculus Solis*, Chabert in B. S. F. 1883, 255. *T. Oculus solis*. "Habemus Ocul. sol. veram ex eodem loco (Vales.)" a Thom., Backer rev.

Umbilicus pendulinus Dec. Belgirate, Ct. Tessin, Lago Maggiore, Koch (outside Switzerland!)

Valeriana elongata L. Tess., Graub.? Heg. *V. Phu* L. Wall., Heg. *Ventenata avenacea* Koel. (*Avena tenuis* Mönch.) Switz., Schleich. *Verbascum austriacum* Schott. (orientale Koch p. Warm parts of Switz., Koch (probably on the indication of Heg.). *V. lanatum* Schrad. Tess. Heg. *V. rubiginosum* "W. K." (nigr.—phoeniceum). Montreux, Koch; the true *rubiginosa* = *V. austriacum*—phoeniceum). *V. Chaixi* Vill. (orientale var. Koch). Switz., Willk. and Lange fl. hisp. *Veronica longifolia* L. Switz., Nym. *Vicia cassubica* L. southern Switz., Heg. and probably afterwards Nym.; Bâle, Wirtg. Reiseff. southern Tyrol! *V. cordata* Wulf. Koch. Warm parts of Switz., Heg. Aarau, E. Zschokke. *V. villosa* Roth. Wall., Graub., Koch probably on the indication of Heg. *Viola Comollia* Mass. Bergün, Brügg., revoked later, Mt. Generoso, Penzig. *V. cornuta* L. Jura, auct. vet.; "nuper vero circa Comum lectam misit Guthnick"; Gaud. syn. Mt. Grammont! probably planted. *V. rothomagensis* Desv. Schynpass, Graub., Brügg. *V. Zoysii* Wulf. Wall. on the ascent of the Chenalotta, Perroud, according to Just, Jahresber.

Xeranthemum cylindraceum Sm. Sion.

Zannichellia pedicillata Fr. Switz., Nym.

Frontier plants.

Aostathal. *Achillea Morisiana*. *Aegilops cylindrica*. *Aethionema Thomasianum* Gay. Chapelle du Crêt: Wolf! *Alsine Villarsii*. *Armeria plantaginea*. *Astragalus alopecuroides*. *Campanula Allionii*. *Carlina acanthifolia*. *Centaurea uniflora*. *Cheilanthes fragrans*. *Crepis pulchra*. *Crupina Morisii* Bor. *Dianthus neglectus*. *D. tener* Balb. Col de l'Arietta! *Erodium Ciconium*: *Festuca flavescens*. *Hacquetia Epipactis*. *Heleocharis carniolica*. *Inula montana*. *Kochia prostrata*.

Mandragora officinalis. *Nepeta Nepetella*. *Ononis cenisia*. *Pedicularis Allionii* Rehb. f. (*rosea* auct. pl.) Alpe Chavannis, Cogne; Wolf! *Podospermum calcitrapifolium*. *Potentilla pennsylvanica*. Barma plenga, 1300 m, Cogne, in abundance: Wolf! *Primula confinis* Schott. *P. pedemontana*. *Salvinia natans*. *Santolina Chamæcyparissus*. *Saponaria lutea*. *Sedum pruinaum* Brot. (*elegans* Lej.) indicated on the gr. St. Bernard. *Sesleria pedemontana*. *Tragopogon crocifolius*. *Tribulus terrestris*. *Verbascum Chaixi* (according to Bouvier).

Lake of Como. *Allium insubricum* Boiss. and Reut. *Alopecurus* (*Colobachne*) *Gerardi*. *Alsine grineensis* (*Moehringia Thomasiana* Gay). *Aquilegia Einseleana* F. Schultz Bauhini Schott). *Asperula umbellata* Reut. *Avena semper-virens* Vill. (according to Parlatores; Christ gives: *A. Notarisii* Parl.) *Biscutella auriculata*. *Briza minor*. *Campanula elatinoidea*. *C. Raineri* *Carex baldensis*. *C. Michellii* (according to Parl.) *Cerastium carinthiacum*. *Cirsium pannonicum*. *Corynephorus canescens*. *Cyperus Michelianus* Link (*Scirpus* L.). *Cytisus purpureus*. *C. sessilifolius*. *Doronicum Columnæ* Ten. (*cordifolium* Sternb. 1818). *Euphorbia carniolica*. *E. variabilis*. *Gladiolus illyricus*. *Hieracium porrifolium*. *Laserpitium peucedanoides*. *Lindernia pyxidaria*. *Medicago carstiensis*. *Melandrium* (*Silene*) *Elisabethæ* (Jan.) Rohrb. *Orchis papilionacea*. *O. provincialis*. *Pedicularis acaulis*. *Peucedanum nitidum* (*hirtellum* Gaud). *P. Schottii*. *Phyteuma Charmellii* Vill. *P. comosum* L. *Potentilla nitida*. *Primula glaucescens* Moretti (*calycina* Duby). *Quercus Ilex*. *Salix glabra*. *Saxifraga Ponæ* (*petræa* Engl.). *S. sedoides*. *Scabiosa Hladnikiana*. *Scorzonera aristata* Ram. (*alpina* Hopp.) according to Christ. *Sesleria sphærocephala*. *Spartium junceum*. *Telekia speciosissima*. *Trapa verbanensis*. *Trisetum alpestre*. *Umbilicus pendulinus*. *Viola Dubyana* Burnat (*declinata* Gaud.).

Veltlin (with Bormio and Chiavenna). *Alopecurus utriculatus*. *Aristolochia pallida*. *A. Pistolochia* (according to Hall. and Rehb.). *Cercis Siliquastrum*. *Erica arborea*. *Hieracium Pollinianum* Bert. *Rhododendron Chamæcistus*. *Sesleria tenella* Host. (*microcephala* Koch). *Telekia speciosissima*. *Viola Comollia*.

Tyrol. See *Hausmann* Fl. v. Tyrol. *Astragalus vesicarius*, Glurns. *Betula humilis*, Trafoi. *Cerastium carinthiacum*. *Ephedra vulgaris* C. A. Mey. *Luzula glabrata*. *Ranunculus hybridus*. *R. pygmaeus* Wahlb. *Saxifraga Hostii*. *S. rhætica* Kerner. *Senecio Cacaliaster*. *Siler trilobum*, Finstermünz according to Hausm. *Verbascum austriacum* Schrad. (*orientale* Koch p.). *Viola Schultzei*.

Lake of Constance. (Bregenz, Lindau, Constance, Högau.) *Aldrovanda vesiculosa*; Logsee, a small pond in

the "Bodenseeried" outside the small village of Gaissau, Vorarlberg. *Allium nigrum*, Ueberlingen. *Betula humilis* Schrank. *Chærophylloides bulbosum*, Höhgau. *Scirpus radicans*, Bregenz according to Sauter.—See *Brunner*, Verzeichniss der Phanerog. und Gefässcrypt. des Bezirks Diessenhofen, des Raudens und des Höhgaus in Mitth. der thurg. naturf. Gesellschaft.

Alsace and the Grand Duchy of Baden. (Neighbourhood of Bâle.) See *Schneider*, Flora v. Basel. 1880.

French Jura. See *Grenier*, Flore jurassique and suppl.

Savoy. See *Bouvier*, Fl. des Alpes.

Adventitious Flora.

See N. Beitr. I, 33, Déséglise in bull. soc. d'étude, sc. de Paris 1881 and Vetter and Barbey in B. S. M. XI, 1883.

Ranunculaceæ. *Clematis Viticella*. *Ranunculus muricatus*.—Papaveraceæ. *Papaver setigerum*.—Fumariaceæ. *Fumaria anatolica*.—Cruciferae. *Alyssum maritimum*. *A. Wierzbikii*. *Biscutella cichoriifolia*. *Brassica elongata*. *Diploaxis erucoides*. *Eruca hispida*. *E. stenocarpa*. *Erysimum repandum*. *Iberis umbellata*. *Lepidium heterophyllum* Benth. (Smithii Hock.). *L. perfoliatum*. *Malcolmia maritima*. *Rapistrum orientale*. *R. perenne*. *Sinapis dissecta*. *Sisymbrium Columnæ*.—Sileneaceæ. *Gypsophyla fastigiata*. *Silene cretica*. *S. dichotoma*. *S. pendula*.—Malvaceæ. *Malva borealis*.—Papilionaceæ. *Medicago lappacea*. *Trifolium purpureum*. *T. supinum*. *Vicia pannonica*. *V. villosa*.—Rosaceæ. *Aremonia agrimonoides*.—Ficoïdeæ. *Tetragonia expansa*.—Cucurbitaceæ. *Ecballium agreste*.—Crassulaceæ. *Sedum populifolium* (Aarburg, for a long time: Rütli; Aigle: Jaccard).—Umbelliferae. *Bupleurum protractum*. *Caucalis muricata*. *Petroselinum segetum*.—Valerianaceæ. *Valeriana Phu*.—Dipsaceæ. *Cephalaria syriaca*.—Compositæ. *Achillea compacta* Willd. nec Lam. *Anthemis austriaca*. *A. ruthenica*. *Artemisia Tournefortii*. *Calliopsis tinctoria*. *Carduus hamulosus*. *Centaurea Biebersteinii* (maculosa var.?). *C. diffusa*. *C. Sadleriana*. *C. orientalis*. *Chrysanthemum segetum*. *Crepis lampsanoides*. *Doronicum scorpioides*. *Eupatorium maculatum*. *Galinsoga parviflora* (see Excursionsfl. 2nd ed. p. 274 and N. Beitr. I, 49). *Lagoseris bifida*. *Microlonchus Clusii*. *M. salmanticus*. *Nardosmia fragrans* (Geneva since 1866. Lugano). *Picris pauciflora*. *Senecio vernalis*. *Solidago glabra*. *S. graminifolia* (N. Beitr. I, 14). *Tragopogon brevirostris* Dec.?—Ambrosiaceæ. *Ambrosia artemisiæfolia*.—Ericaceæ. *Erica vagans* (N. Beitr. I, 34).—Ascle-

piadeæ. Vincetoxicum nigrum.—Polemoniaceæ. Phlox Drummondii.—Convolvulaceæ. Convolvulus siculus. C. tricolor. Pharbitis hispida.—Boragineæ. Cynoglossum pictum. Lithospermum apulum. Nonnea lutea. Symphytum tauricum (and orientale?).—Solanaceæ. Petunia nyctagini-flora. Solanum verrucosum (see Dec. prodr. XII, 677).—Scrophulariaceæ. Antirrhinum Asarina. Linaria purpurea. Mimulus luteus. Verbascum austriacum. V. Chaixii. V. phoeniceum. Veronica peregrina.—Labiatae. Salvia sylvestris. S. verbenaca. Scutellaria Columnæ. Sideritis montana. Stachys italica.—Primulaceæ. Lysimachia Ephemerum. Primula japonica (N. Beitr. I, 34).—Plantaginaceæ. Plantago argentea Chaix. P. Coronopus.—Amarantaceæ. Amarantus albus. A. oleraceus. A. patulus. A. paniculatus.—Chenopodiaceæ. Chenopodium ambrosioides. Salsola Kali. Suaeda maritima.—Polygonaceæ. Polygonum cuspidatum. P. orientale.—Liliaceæ. Asphodelus clavatus.—Gramineæ. Aegilops ovata. A. squarrosa. Bromus macrostachys. B. madritensis B. maximus. B. rubens. Elymus crinitus. Hordeum maritimum. Koeleria phleoides. Phalaris quadrivalvis Lag. (brachystachys Gr. G.). Ph. paradoxa. Triticum villosum. Vulpia incrassata.

Addenda.

Rosa pomifera-rubiginosa. Zermatt; Christ.—**Epilobium**. New: E. nutans Tausch (alpinum var. K. E. heterophyllum Heg.) Alp.; G. W. O. U. Hybrids: E. collinum-parviflorum, Lamyi-parvifl., montanum-organifolium (salicifolium Faech.), montanum-palustre.—**Heracleum** Pollinianum Bert. Val Camogask: Morth. Cornaz.—**Quercus** pubescens-sessiliflora (glabrescens Kern.? not Benth.) near Liestal: Christ.—**Ulex** europæus: Monte San Bernardo in Tess, in large quantities and without doubt spontaneous: Mari, Favrat.

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